

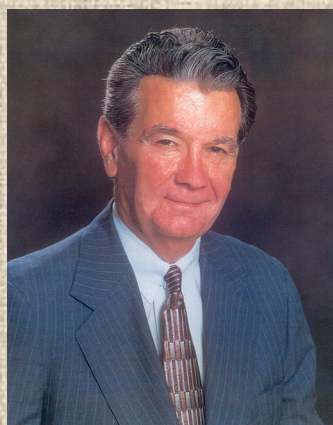


HAMPDEN COUNTY REGISTRY OF DEEDS

DAMS FILE COLLECTION

BOOK D25 – 4 (U-Z)

Reports Section—Dams - Hampden County Massachusetts



*Donald E. Ashe, Register
Hampden County Registry of Deeds,
a Division of the Office of
William Francis Galvin, Secretary of the Commonwealth*

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SEWAGE DISPOSAL
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DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

CD

Nov. 30, 1956

The Hon. the Board of County Commissioners
Hampden County Court House
Springfield, Mass.

Gentlemen:

Recent inspections of dams in the Town of Wales have now completed the inspection routine in the community and all dams have been examined once or more times during 1956. The following is a report on the condition of the various dams situated in Wales.

A. D. S. Perry Dam.

This structure is a masonry and earth embankment dam forming a very small pond in the southeasterly corner of Wales, easterly of Union Road. The pond formed by the dam is used for private recreational and farming purposes. During the flood of August, 1955, the dam was topped by the flood water and two small wash-outs occurred in the earth fill below the dam. Some of the earth fill under the concrete spillway chute was washed away causing it to settle and crack in a few places. This dam impounds no water at the present time and when last inspected the flood damage had not been repaired. Though this dam has been carried on the records of County dams, it is doubtful if the structure does come under County control. The drainage area involved is only a fraction of a square mile, the dam height is less than 10 feet and it is my opinion, the water stored behind the dam is less than one million gallons, when the pond is full.

B. Lake George Dam.

This structure is at the northerly end of Lake George and carries the roadway of Stafford Road. The roadway embankment forms the dam and the conduit or culvert under the road together with its head works forms the spillway for the structure. During the flood of August 1955 no damage was done at this dam. It was reported that 3.5 feet of water was flowing over the crest of the spillway inlet at the culvert headworks. When last inspected this dam was found to be in good condition.

C. Squires Dam. This is a small dam located on Monson Road, just westerly of the Center of Wales. The road embankment of Monson Road actually forms the mass of the dam. The culvert under the road

together with its inlet works forms the spillway. The pond is a private body of water used for recreational and farm purposes. No damage was done at this dam during the flood of August 1955. When last inspected the dam was found to be in a satisfactory condition.

D. Needham Dam. This is an abandoned and breached stone masonry structure that is located on Wales Brook near Wales Center and just westerly of Haynes Hill Road. This dam has been breached for many years but the structure is inspected annually to be certain that a free waterway is maintained.

E. D. S. Maynard Dam.

This structure is an earth embankment with a steel tube spillway. The dam is very shallow, located on a tributary to Wales Brook at a point just westerly of Haynes Hill Road. This dam does not come under County jurisdiction but is inspected annually to be certain that the height of the dam is not raised nor the storage capacity of the pond increased without following the proper procedure and filing plans and specifications.

F. Bramble Dam.

This is an abandoned structure and today only traces of a dam remain. It is located on Hollow Brook easterly of Hollow Road near the Brimfield Town Line. The pond area behind this dam site is completely overgrown with brush and trees. The site is examined annually to be certain that a free waterway is maintained.

G. Shaw Dam. This structure is an earth and masonry dam with a masonry overflow spillway located on Wales Brook near the center of Wales. Laurel Hill Road passes over the dam and the spillway. In the flood of August 1955 the dam was topped and a portion of the earth structure washed thru. The washout was immediately repaired and the pond restored. When last inspected the dam was found to be in satisfactory condition. There is a small washout just downstream of the right abutment that should be repaired and precautions should be taken to prevent further wash by surface water.

H. Wales Woolen Company Dam.

This is an abandoned and breached structure located downstream from the dam just described and southerly of State Road. This structure has been abandoned and breached for many years and only traces of the old dam now remain. The site is inspected annually to be certain that a free waterway is maintained.

I. Sagalyn Dam.

This is a masonry structure located on Wales Brook just downstream from the dam site above described. During the flood of August 1955 the dam was topped by flood water and some earth downstream from the

masonry structure was washed out. This dam has apparently been abandoned for many years. It has been inspected annually and its condition has always been satisfactory. The gate thru the masonry dam has normally been open and no pond is formed behind the dam. In spite of the fact that the structure has been abandoned, the masonry is in relatively good condition. At one time the dam was used to divert water into a small canal apparently for power purposes. Since there is no further practical use for this dam, it would be advisable for the Owner to remove the structure and provide a free waterway for the stream. The pond area behind the dam is very small and consequently the structure is not dangerous from a safety viewpoint.

J. Zabawa Dam.

This is a very small dam situated easterly of Tiderman Road near the Brimfield-Wales Town Line. The drainage area of the dam is very small and the water ponded is less than one million gallons. The height of the dam is well below 10 feet. In the past the Owner indicated a desire to increase the quantity of water in storage. Since that time the structure has been inspected annually but as of 1956 no enlargement has been made. The dam was not damaged in the flood of August 1955. As now existing the dam does not come under County Control.

K. Norcross Dams.

The Norcross dams are located on Vinica Brook or streams tributary thereto. All of the dams are situated in an area set aside by Mr. Norcross as a Wild Life Sanctuary, commonly known as Tupper Wild Life Sanctuary. The dams form ponds that are used in operating the sanctuary, for wild life purposes and fire protection.

Dam #1. This is the lower of the dams on Vinica Brook and is an earth embankment with a concrete masonry spillway. During the flood of August 1955 the earth embankment at this dam was washed thru for a width of approximately 40 feet to the left of the spillway structure. Apparently the dam was topped by about 6-inches of water. The spillway structure was not damaged by the flood waters. The breach formed by the flood has not as yet been repaired and provides a free waterway for the passage of storm flows.

Dam #2. This is an earth and masonry structure located upstream about 2500 feet from the dam last described. Dam #2 was not damaged in the flood of August 1955. When last inspected this structure was in excellent condition. The earth embankment is generous in section and the masonry spillway is in good condition.

Dam #3. This dam is similar to the structure just described. It is about 1,000 feet upstream and it too is in excellent condition. No damage was done to the dam by the flood of August 1955. To the right of the spillway wall a small surface wash has occurred. This condition was pointed out to Mr. Begg, the sanctuary superintendent and he will have this condition repaired.

Dam #4. Dam #4 forms a large pond that is very shallow in depth. The dam is located upstream from Dam #3 approximately 2,000 feet. No damage to the structure occurred in the flood of August 1955. When last inspected this dam and spillway were in very good condition.

Dam #5. Vinica Pond Dam.

This structure forms Vinica Pond and has a fairly large earth embankment with an excellent masonry overflow spillway. No damage occurred to the structure in the flood of August 1955. When last inspected this dam and its spillway were in excellent condition.

Dam #5. Trout Pond Dam.

This is a very small earth and masonry structure located upstream approximately 1500 feet from Vinica Pond dam. No damage was done as the result of the flood of August 1955. When last inspected the dam and its spillway were in excellent condition.

Dam #7. Meadow Brook Dam.

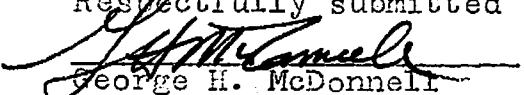
This is the uppermost and last in the series of dams on Vinica Brook. It is a very small earth dam with a small but satisfactory masonry overflow spillway. It is not in very good condition but though dilapidated it is not dangerous. The pond formed by the dam no longer has any practical use and Mr. Begg informed the undersigned that the dam will be breached, a free waterway formed and the structure abandoned.

Dam #8. Tupper Pond Hole Dam.

This is a very shallow and small earth and masonry dam in the southwesterly corner of Wales. It is in relatively good condition and was not damaged in the flood of August 1955. When last inspected the dam and spillway were found to be in satisfactory condition.

In summary, of the 18 dams and dam sites in Wales, 3 are abandoned dams that are checked annually to be certain that a free waterway is maintained thru the breached dams at all times. Of the remaining 15 dams, 1 was washed thru completely and has not as yet been repaired. This is the Norcross Dam #1. If and when this dam is repaired the Owner will file plans and specifications. Only 2 dams suffered damage of any consequence. One of these, the Shaw Dam was washed thru but the breach immediately repaired since the dam carries Laurel Hill Road. The other structure has not been repaired and it is doubtful if this dam comes under County jurisdiction. This is the Perry Dam.

Respectfully submitted



George H. McDonnell
County Hydraulic Engineer

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DAMS & POWER INSTALLATIONS

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HOUSING DEVELOPMENT

WASTE DISPOSAL

CD Wales
Sept. 18, 1957

The Hon. the Board of County Commissioners
Hampden County Court House
31 Elm Street
Springfield, Mass.

Gentlemen:

Recent inspections of dams in the Town of Wales have now completed the inspection routine in this community and all dams within the Town have been examined one or more times during the year 1957. The following is a report on the condition of the various dams situated in Wales.

A. D. S. Perry Dam.

This dam is in the same general condition as last reported in my inspection report of 1956 on the Town of Wales. No repair of the flood damage has been done. Two washouts downstream of the masonry wall still exist and the masonry spillway chute has been undermined. No pond is formed behind this dam and the undersigned has not seen a pond at this dam for many years. Since the height of the dam is under 10 ft., the drainage area less than one square mile and the amount of water stored behind the dam when filled is, in the opinion of the undersigned, less than one million gallons, the structure does not come under County control. It has been carried in the inspection books for a number of years and the undersigned continues to inspect it to be certain that it is not increased in height to a point where it would come under County jurisdiction.

B. Lake George Dam.

This dam was found to be in excellent condition.

C. Squires Dam(Now Morgan)

This dam was found to be in satisfactory condition.

D. Needham Dam.

This dam has been breached for many years. A free waterway exists at the site of the structure to prevent ponding of storm flows. The site of the dam is inspected annually to be certain that the breach is not closed and that the free waterway is maintained.

E. D. S. Maynard Dam.

This dam was found to be in satisfactory condition.

F. Bramble Dam.

The dam at this site has been breached for many years. A free waterway exists for the passage of storm flows. The site is examined annually to be certain that the dam is not rebuilt and that a free waterway is maintained.

G. Shaw Dam.

This dam is located on Wales Brook near the center of Wales. Laurel Hill Road passes over the dam on a bridge at about the spillway location. The right abutment wall of the dam just downstream of the spillway structure is being undermined. If this undermining continues the wall may fail. It is recommended that this condition be called to the attention of the Owner and that the Owner be advised to correct the condition in order to protect both the dam and the bridge.

H. Wales Woolen Co. Dam.

This structure has been abandoned and breached for many years. A free waterway exists at the site of the dam. The site is inspected annually to be certain that the waterway is maintained and the dam is not replaced without the filing of proper plans and specifications.

I. Sagalyn Dam (Now Town of Wales)

This dam is rather dilapidated and in the same condition as noted at the time of inspection in 1956. The dam should be breached at about the spillway section if the structure is not going to be used again. Breaching of the dam would increase the protection to the roadway adjacent to the property from damage by extreme flood flows. This condition was called to the attention of the Selectmen of the Town of Wales by your Board in a letter dated Jan. 23, 1957. It is recommended that the condition again be brought to the attention of the Board of Selectmen.

J. Zabawa Dam.

At the time of my last inspection it was noted that improvements to the pond area had been started. The pond has been completely drained and large quantities of sand have been pushed around the pond to make sandy shore areas. Improvements being made to the dam and the pond will apparently result in a storage capacity of less than one million gallons and the height of the dam will probably be approximately 6 ft. Since the drainage area is a small fraction of a square mile, the dam as now being

altered and repaired does not come under County jurisdiction. The undersigned will continue to inspect the dam and pond to be certain that the size of the structure does not exceed the minimum limits unless plans and specifications are prepared and filed.

K. Norcross Dam.

All dams on the property of Norcross were inspected in the presence of an employee of the sanctuary. The condition of each dam was then discussed at the site with the manager of the property.

Dam No. 1.

This dam is still breached and no pond is formed. The free waterway at the site of the breach is sufficient to allow passage without forming any pond.

Dam No. 2. Excellent condition.

Dam No. 3. Excellent condition.

Dam No. 4. Excellent condition.

Pond Hole Dam. Excellent condition.

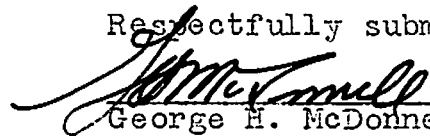
Vinica Pond Dam.

This structure is in satisfactory condition. There is a small amount of leakage at the bottom of the spillway chute under the bridge across the spillway. This condition is probably ground water seepage coming up thru the ground and it is so small that its condition is not serious nor does it warrant any investigation or maintenance work.

Trout Pond Dam. (Upper Vinica) This dam is in satisfactory condition.

Meadow Brook Dam. The gate at this dam is open and no pond is formed. Some of the earth of the embankment has been washed out by extreme storm flows. The dam has been abandoned and will be breached. The dam as existing presents no danger to persons and property downstream.

Respectfully submitted


George H. McDonnell

County Hydraulic Engineer

GHM/cmb

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DAMS & POWER INSTALLATIONS
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WASTE DISPOSAL

CD Wales
Oct. 25, 1957

The Hon. the Board of County Commissioners
Hampden County Court House
Elm Street
Springfield, Mass.

Gentlemen:

In connection with the telephone call received on Oct. 16, 1957, pertaining to a request by Selectman Robert Gagnier, of Wales, for an inspection of the Lake George Dam in Wales, I report as follows:


The undersigned inspected the entire dam on the following day, October 17, 1957, and could find nothing of a serious nature that required attention at this structure. The examination by the undersigned included the area of the road, the downstream portion of the dam on the grassed-over area, a thorough review of the conduit, and a review of the inlet works to the conduit, as well as the stoplogs themselves. A subsequent conversation, via telephone, with Selectman Gagnier indicated that he was concerned with the condition of the stoplogs at the head of the conduit structure. These stoplogs were found to be in satisfactory condition. There was very little evidence of deterioration of these stoplogs and no indication whatsoever of any weakening or tendency toward failure. The stoplogs themselves were probed for any sign of rot or cracking and none was apparent. It was noted that there is slight leakage thru the stoplogs particularly at the end areas where the logs are keyed into the concrete of the headworks. This condition is not serious and does not warrant the removal and replacement of the stoplogs. The small amount of leakage occurring at the end of the stoplogs has no relation to the safety of the dam and the sudden release of the impounded water. The leakage that has occurred and was occurring at the end of the stoplogs is more important from a water loss viewpoint in these dry times. It is suggested that if the leakage is to be stopped from a water saving viewpoint, the owner of the dam could caulk the ends of these stoplogs where they are now keyed into the concrete. Any type of caulking yarn or caulking jute could be used if it is driven into the end areas of the stoplogs from the upstream side.

-2-

In summary then, Selectman Gagnier can be officially notified that there is no danger at the Lake George Dam and that if the small amount of leakage occurring around the ends of the stoplogs is to be reduced to a minimum, a simple caulking job can take care of this condition.

I have already informed Mr. Gagnier that from a structural viewpoint these stoplogs are safe.

Respectfully submitted


George H. McDonnell
County Hydraulic Engineer

GHM/cmb

November 1, 1957

Board of Selectmen,
Town of Wales,
Mass.

Dear Sirs: Attention: Mr. Robert P. Gagnier

We enclose herewith for the Town files
a copy of letter dated October 25, 1957 from George H.
McDonnell, County Hydraulic Engineer, in regard to
Lake George Dam in Wales.

Very truly yours,

HAMPDEN COUNTY COMMISSIONERS

By _____ Chairman.

WFS/N
encl.

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON
TEL. JEFFERSON 3-3991

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CD Wales
Oct. 30, 1958

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Recent inspections of dams in the Town of Wales have now completed the inspection routine in this community and all dams within Wales have been examined one or more times during the year 1958. The following is a report on the condition of the various dams situated in Wales.

A. D. S. Perry Dam

This dam is in the same general condition as previously reported. No repair of flood damage has been made. Apparently the dam is being abandoned. No water is being stored behind the structure. Since this dam presents no danger to persons and property downstream, conditions are considered satisfactory.

B. Lake George Dam.

This dam was found to be in very good condition. The spillway culvert under the highway should be kept free of debris. Frequent inspections should be made to be certain that all miscellaneous debris caught in the conduit is removed.

C. Squires Dam (Now Morgan)

This dam was found to be in satisfactory condition.

D. Needham Dam

This dam has been breached for many years and a free waterway exists at the site of this structure. No water is ever ponded even in time of high brook flows.

E. D. S. Maynard Dam

This dam was found to be in satisfactory condition.

F. Bramble Dam

No dam exists at this site and the brook flows freely thru the location of the old structure. The pond area is heavily grown over with brush and trees. There seems to be no further need to inspect the site of this abandoned dam.

G. Shaw Dam

This dam is in satisfactory condition. The necessary maintenance work recommended at the right abutment has been done and the condition of undermining corrected.

The spillway capacity of this structure is quite small compared to the drainage area involved. It would be advisable to give consideration to the construction of an adequate spillway.

H. Wales Woolen Co. Dam

This dam is still breached and the site has been abandoned. The breach thru the structure is ample to allow for free flow of the brook. The site is inspected annually to be certain that the breach thru the dam is not closed without proper approval of plans and specifications.

I. Sagalyn Dam (Now Town of Wales)

This dam no longer ponds water. Recommendations made in previous years regarding the desirability of breaching this dam have been carried out. A large opening has been made thru the concrete masonry of the dam and the brook now flows freely thru this structure.

J. Zebawa Dam

This dam as now constructed does not come under County jurisdiction. The dam has been built to form a pond for recreational and aesthetic purposes. Around the pond the owner has constructed an historical exhibit that is opened to the public. The dam will be inspected annually to be certain that it is not enlarged to result in the storage of more than 1,000,000 gallons of water.

K. Norcross Dams

All of the existing dams on the property of Norcross at the Tupper Wild Life Sanctuary were inspected in the presence of the manager of this property. The condition of each dam has been discussed at the site with the manager.

Dam No. 1 This structure is still breached as the result of the flood of August, 1955 and no pond is formed. There is a free waterway thru the breach that is sufficiently wide to allow for safe passage of flood flows.

Dam No. 2 This dam was found to be in excellent condition. Emergency overflow tubes have been constructed in the embankment of the dam. These tubes are two in number and are 18" in diameter. They are constructed of corrugated iron and are tar-coated. The inverts of the tubes are paved. The tubes were installed in a packed and puddled clay. The manager of the property will install seepage collars on the tubes to improve the safety factor. A plan of the modification of this dam and the following two dams will be filed with the County.

Dam No. 3 This dam was found to be in excellent condition. The same auxiliary spillway tubes have been installed and seepage collars are to be placed around the pipe.

Dam No. 4 This dam was in excellent condition. The same note regarding the auxiliary spillway tubes is applicable to this dam.

Pond Hole Dam This dam was found to be satisfactory.

Vinica Pond Dam At the time of the inspection the pond had been drained. A complete inspection of the dam and spillways was made because of the fact that no water was stored. The dam was found to be in good condition and both the main spillway and auxiliary spillway were satisfactory. A small amount of seepage or leakage into the main spillway chute reported in 1957 was naturally not noticed since the pond was empty.

Trout Pond Dam This dam was found to be in satisfactory condition. A fish screen was installed in the spillway and the undersigned pointed out to Mr. Begg, the property manager, that a sloping screen with an underwater entrance would be more advisable at this location.

Meadow Brook Dam The gate at this dam is open and no water is ponded. The entire pond area is being filled in with earth and a small channel will be left for the passage of brook flows. Since the structure is to be abandoned and the entire pond filled, no further inspection will be necessary at this dam.

Resepctfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

CD Wales
August 26, 1959

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Recent inspections of the various dams situated in the Town of Wales have now completed the inspection routine in Wales and all dams within the community have been examined at least once during the year 1959. The following is a general report on the condition of the dams located in the Town of Wales.

A. D. S. Perry Dam

This structure is in the same general condition as has existed since the flood of August, 1955. No water is ponded and it appears as if the structure has been abandoned by the Owner. The pond area is being overgrown with miscellaneous vegetation. The dam as now existing does not present any danger to persons and property downstream. Thus, conditions at the dam are considered satisfactory.

B. Lake George Dam

This dam was found to be in good condition. The spillway also was found to be in good condition. The conduit underneath the roadway and the embankment of the dam should be checked frequently for any collection of boulders or debris. Any such collection should be removed immediately on being discovered.

C. Squires Dam (Now Morgan)

This dam was found to be in satisfactory condition.

D. Needham Dam

This structure has been breached for a number of years and a free waterway exists to allow for the passage of stream flow. No water is ponded at the site of this dam even in time of high rates of runoff. Conditions thus, are satisfactory.

E. D. S. Maynard Dam

This dam is quite small and dilapidated. However, the structure is safe and satisfactory for the time being.

F. Shaw Dam

This dam was found to be in satisfactory condition. The spillway capacity of the structure is quite small compared to the drainage area involved. It would be advisable to give consideration to the construction of an adequate spillway so that in time of extreme runoff, the roadway and bridge over the dam would not be endangered.

G. Wales Woolen Co. Dam

This structure is still breached and a wide waterway exists at the site of the dam for the free passage of storm flows. No water is ponded at this site by the old structure.

H. Sagalyn Dam (Now Town of Wales)

This dam no longer ponds water. The breach made by the owner in the recent past provides for the free flow of the stream. Conditions at the dam were found to be satisfactory.

I. Zebawa Dam

This dam is still in the same general condition as reported previously. As now constructed, it does not come under County jurisdiction. The dam forms a small pond for recreational and aesthetic purposes. Around the pond, the owner has constructed an historical exhibit that is opened to the public. The dam is inspected annually to be certain that it is not raised to result in the storage of more than one million gallons of water. Conditions at the dam are satisfactory.

J. Norcross Dams

All of the dams on the property of Mr. Norcross at the Tupper Wild Life Sanctuary were inspected in the presence of the manager of this property. The condition of each dam is summarized as follows:

Dam No. 1 This structure is still breached as the result of the flood of August, 1955 and no ponding of water occurs. There is a wide free waterway thru the old dam that allows for the safe passage of all stages of brook flow. The owner is giving consideration to the restoration of the dam and the manager states that proper plans and specifications will be filed before any work proceeds in connection with the rebuilding of the structure.

Dam No. 2 This dam was found to be in very good condition. Alterations to the overflow pipes as previously recommended in 1958 have not as yet been done. However, the manager plans to install the seepage collars on the overflow tubes during the coming fall months.

Dam No. 3 This dam was found to be in excellent condition. The same general notation regarding the spillway tubes apply to this structure. The seepage collars as previously recommended will be installed this coming fall.

Dam No. 4 This dam was found to be in excellent condition. The same general notation regarding the spillway tubes apply to this structure. The seepage collars as previously recommended will be installed this coming fall.


Pond Hole Dam This is a low dam that forms a very shallow duck pond. Conditions at the dam were found to be satisfactory.

Vinica Pond Dam Both the embankment of the dam and the spillway structure were found to be in very good condition. The pond was empty and the drain valve open. The owner has drained the pond with the thought in mind of dredging muck and debris from the pond bottom. Conditions at this structure are good.

Trout Pond Dam This dam was found to be in good condition. Both the spillway and the embankment are satisfactory. Screens were noted in place on the spillway and the Owner was advised to either construct a non-clog type of screen or to install a type suspended from the top that can swing free when clogging causes a build-up of stored water. This pond is immediately upstream from Vinica Pond and is very small in size. Even with the sudden loss of Trout Pond Dam, Vinica Pond would be able to absorb the flow thru the breach of this dam. Consequently, even with the undesirable screen in place, conditions at Trout Pond Dam are satisfactory.

Meadow Brook Dam Conditions noted in 1959 are the same as those previously reported. The gate at the dam is open and no water is ponded. The pond and dam are to be abandoned and the pond area will be filled. No further inspections will be necessary once this has been accomplished.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wales
Sept. 9, 1960

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections conducted recently of dams situated in the Town of Wales have resulted in all dams in that community being inspected at least once during the year 1960. The following is a report on the general condition of the various dams situated within the Town of Wales.

A. D. S. Perry Dam

This structure is still in the same general condition as noted each year since the flood of August, 1955. The pond area behind the dam is fairly well filled in with silt and sand and the surface area is becoming overgrown with miscellaneous brush and vegetation. It would seem that this small dam is being abandoned by its owner. As existing, the dam does not present a danger to persons and property downstream. Thus, though the dam is dilapidated and the masonry partly undermined, conditions are considered satisfactory.

B. Lake George Dam

The dam was found to be in good condition. However, the culvert outlet under the highway and thru the dam is partly blocked with boulders and the front section of a boat was noted in the inlet end of the overflow culvert. This section of boat could move into the culvert at time of high flow causing partial or complete plugging of the culvert. Should this occur, and heavy runoff conditions take place, the level of the lake could rise materially and overflow bordering property as well as top the dam. The culvert should be cleaned, inspected frequently, and kept in a clean condition.

C. Squires Dam

This dam was found to be in a satisfactory condition.

D. Needham Dam

This dam is still breached and no pond is formed. The dam has been breached for many years. The pond behind the dam was a very small body of water. The area of the pond is fairly well overgrown with brush and vegetation. It is doubtful if the dam will ever be activated at this site again. However, since the site is easily accessible from the main road, it is inspected annually to be certain that the breach in the old dam is not closed. As existing, the breach is wide enough to pass storm flows.

E. D. S. Maynard Dam

This dam is in the same condition as noted in previous years. The structure is quite small and though dilapidated, is safe. Only a small volume of water is stored behind this dam.

F. Shaw Dam

This dam was found to be in satisfactory condition. The spillway capacity of the structure is small for the drainage area involved and it should be enlarged to provide protection for the adjacent roadway and the bridge.

G. Wales Woolen Co. Dam

This dam has been breached for many years and a wide, free waterway exists for the passage of storm flows thru the breach. No pond is formed. Conditions at the site of this old dam are satisfactory.

H. Sagalyn Dam (Now Town of Wales)

Conditions at this dam are satisfactory. In recent years, the owner has cut a wide and deep breach thru the masonry to allow for free flow of the brook and to prevent ponding of water.

I. Zabawa Dam

Conditions at this structure are the same as reported in previous years. As now built, the dam does not come under County jurisdiction. It forms a small pond used for recreational and aesthetic purposes. Surrounding the pond the owner has constructed an historical exhibit that is open to the public. Each year the dam is inspected to be certain that it is not raised to result in a condition where the storage behind the dam would increase to more than 1,000,000 gal. of water.

J. Norcross Dams

Every dam on the property of Mr. Norcross at the Tupper Wild Life Sanctuary was inspected in the presence of the manager of this property. Conditions at each dam as noted are listed as follows:

Dam No. 1 The reconstruction of this dam is progressing very satisfactorily. The new spillway has been constructed in accordance with the approved plans and specifications. Construction work has been carried on with a high degree of quality and workmanship. A major portion of the new earth embankment has been placed and there only remains a small quantity of earth to be placed and compacted adjacent to the left abutment of the new spillway. Special impervious material will be hauled in for this work. On the day of the last inspection, Sept. 1, 1960, workmen were completing the masonry at the discharge end of the draw-off pipeline. The left end of the dam has been increased considerably in cross-section and consequently, the structure is well built with a high safety factor. When all completed, this dam will be in excellent condition. At the present time, no water is stored upstream of the dam since there still remains the work of placing compacted fill to the left of the new spillway. The owner at present is beginning to clean and clear the pond bottom of material washed in by the flood of 1955, and vegetation that has grown upon the dry bottom over the past five years.

Dam No. 2 This structure was found to be in excellent condition. Alterations to the overflow pipe as previously recommended and discussed have not as yet been accomplished. The manager of the property states that seepage collars will be installed during the coming fall or winter season.

Dam No. 3 This structure was found to be in excellent condition. Alterations to the overflow pipe as previously recommended and discussed have not as yet been accomplished. The manager of the property states that seepage collars will be installed during the coming fall or winter season.

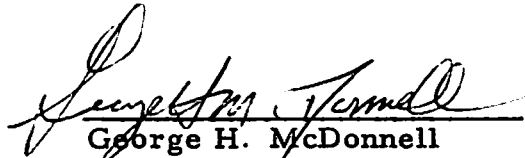
Dam No. 4 The embankment at this dam has been greatly enlarged and improved. Thus, the embankment is stronger now than previously. In the past the dam has always been found to be in good condition. As now existing, the dam embankment is excellent. Collars needed on the emergency spillway tube have not as yet been placed but the manager of the property states they will be installed in the coming fall or winter season.

Pond Hole Dam The embankment and the spillway of this dam were found to be in excellent condition.

Vinica Pond Dam The embankment at this dam is in excellent condition. It has been improved and enlarged during the past year. The masonry of the spillway is also in excellent condition. The pond is still empty as reported a year ago and the drain valve is open. From time to time, the owner has had certain improvements made in the pond bottom and it is expected that water will be stored again at this site in the near future.

Trout Pond Dam This dam was found to be in excellent condition. The embankment is well shaped and strong. The spillway masonry is in good condition.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wales
Oct. 18, 1961

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections conducted recently of dams situated within the Town of Wales have now resulted in all dams in that community being inspected at least once during the year 1961. The following is a report on the general condition of the various dams situated within the Town of Wales.

A. D. S. Perry Dam

This dam was still in the same general condition as noted each year since the flood of August, 1955. The pond area behind the dam has become fairly well filled in with silt and sand and the surface area of the old pond is becoming overgrown with brush and vegetation. It would appear that the small dam is being abandoned by its Owner. As existing at the present time, the dam does not present a danger to persons and property downstream. Thus, though it is quite dilapidated and a portion of the masonry undermined, conditions at the dam are satisfactory.

B. Lake George Dam

The entrance to the spillway structure was found to be in satisfactory condition. The masonry is in good shape and stop logs were O.K. The top stop log seemed to be newly placed. The culvert thru the embankment appeared to be quite well maintained and no debris was noted either in the culvert or at either end. The embankment of the dam is in good condition.

C. Squires Dam

This dam is nothing more than the highway embankment and a culvert under the embankment for the passing of the stream flow. The culvert has a small concrete lip in the entry-way which forms the shallow swampy pond. The structure was in satisfactory condition.

D. Needham Dam

This dam has been breached for many years and no pond is formed. The breach is wide enough to pass storm flows. It is quite doubtful that any construction will ever take place at the site again and consequently, future inspections do not seem necessary. Little evidence of the old dam now remains.

E. D. S. Maynard Dam

This dam is in the same general condition as reported in previous years. The structure is very small and though quite dilapidated, is safe. It stores only a small volume of water in a shallow pond. The dam is not well maintained but it is negligible in size.

F. Shaw Dam

The spillway capacity at this dam is still in need of enlargement. Unless the pond upstream of the dam is of some particular value, it would seem advisable to increase the capacity of the spillway notch by lowering the spillway crest. At the right abutment of the dam and just downstream thereof, the stone masonry wall is in need of repair.

G. Wales Woolen Co. Dam

This dam is still breached and the opening thru the structure is wide and deep. No pond is formed during any condition of stream flow.

H. Sagalyn Dam (Now Town of Wales)

The condition at this dam was found to be satisfactory. The man-made breach thru the masonry is quite wide and deep so that no water is ponded in time of flood flow. The breach seems to be wider and deeper this year than noted in the past.

I. Zabawa Dam

Conditions at this dam were the same as reported in previous years. As now existing, the dam does not come under County jurisdiction. It forms a very small pond used for recreational and aesthetic purposes. The pond is in an area used as an historical exhibit. From all appearances, the area has not been in operation very much this past year. It was closed and the gate locked at the time of the annual inspection of the dam. It would appear that the Owner does not now plan any major expansion or increase in the size of the structure.

J. Norcross Dams

Every dam on the property of Mr. Norcross at the Tupper Wild Life Sanctuary was inspected in the presence of Mr. Begg, Manager of the property. Conditions as noted at each dam are listed as follows:

Dam No. 1 This dam was found to be in excellent condition. All work has been completed on the construction of the new spillway except for the roadway bridge over the spillway itself. The embankment is in excellent shape and a good growth of sod is being encouraged. The spillway masonry is in excellent condition. It is possible that erosion will occur at the toe of the new spillway section. This condition will be observed from time to time in the future.

Dam No. 2 This dam was found to be in very good condition. Alterations to the overflow pipe as previously recommended and discussed with the manager have not as yet been accomplished. However, since the overflow pipe involved will only function at time of extreme flood flow, the actual need for the recommended seepage collars is not too pressing.

Dam No. 3 This dam was found to be in very good condition. The embankment was quite satisfactory and the spillway masonry excellent. A planting crew was in the process of setting out small cedar trees on the downstream slope of the embankment. This was being done to improve stabilization of the embankment soil. The trees may remain in place as long as they do not grow too large. Seepage collars on the emergency overflow pipes have not as yet been installed but will be in the not too distant future. They are not absolutely essential to the safety of the structure.


Dam No. 4 The embankment at this dam was found to be in excellent condition. It is a wide embankment with a very good freeboard. The spillway tube and chute were found to be in excellent condition.

Pond Hole Dam The embankment and the small masonry spillway were found to be in excellent condition.

Vinica Pond Dam The embankment was found to be in very good shape and the spillway in excellent condition. The pond was full and overflowing at the time of the annual inspection. The pond has been empty for the last few years while the manager of the property was cleaning and grading the pond bottom. No sign of seepage was noted in the spillway chute as reported a few years back when the pond had previously been filled. The seepage would not necessarily be noticeable with the water overflowing the spillway chute. Seepage will be checked again next year. The side spillway at this dam was found to be in good condition. Vegetation was growing from the screen in the spillway and Mr. Begg will have this vegetation cleaned out.

Trout Pond Dam This dam was found to be in excellent condition. The spillway was in very good shape also.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

Oct. 25, 1961

Board of Selectmen
Town Office
Wales, Mass.

Gentlemen:

In accordance with Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition, and safety of the dams of Hampden County, you are hereby advised that the dam on Wales Brook just downstream from the center of Wales and known in the County Records as the Shaw Dam, has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The spillway capacity at this dam is still in need of enlargement. Unless the pond upstream of the dam is of some particular value, it would seem advisable to increase the capacity of the spillway notch by lowering the spillway crest. At the right abutment of the dam and just downstream thereof, the stone masonry wall is in need of repair."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BD. OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

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CONSULTING ENGINEERS

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wales
Aug. 15, 1962

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections conducted recently of dams situated within the Town of Wales have now resulted in all dams in that community being inspected at least once during the year 1962. The following is a report on the general condition of the various dams situated within the Town of Wales.

A. D. S. Perry Dam

This dam, breached in the flood of August 1955, has not held water nor been in active use since that time. The dam is relatively low in height, the quantity of water that was ponded prior to the breaching of the dam was but a small fraction of a million gallons and the drainage area involved is quite small. Even if restored, it is doubtful that this dam would come under County jurisdiction. It is recommended that the dam be dropped from the annual inspection routine.

B. Lake George Dam

This dam was found to be in satisfactory condition. The entrance to the spillway structure was clear and clean of any debris. Stoplogs in the masonry structure were at a grade whereby the top of the upper stoplog was level with the top of the concrete masonry in which the stoplogs set. The embankment is in good condition. An examination of the culvert indicates the presence of large loose boulders and some debris. This culvert should be inspected from time to time and all debris, loose boulders or any object that would interfere with the flow of water should be removed.

C. Squires Dam

The dam is the same as noted and reported in previous years. The embankment is the highway and the spillway is the culvert under the highway. A small concrete lip forms an entry-way to allow water to overflow into the culvert. The culvert was found to be in good condition and to be clear of any debris. The dam was considered satisfactory when last inspected.

D. Needham Dam

This dam was breached many years ago and no pond has been formed for some time. The breach is wide and little of the old dam remains. It is quite doubtful if this structure will ever be activated again and it is recommended that no further inspections be made at this site.

E. D. S. Maynard Dam

This structure is in the same general condition as reported in recent years. The dam is small and though quite dilapidated is not considered dangerous. The quantity of water stored is small and the pond volume is becoming overgrown. Though the dam is not well maintained, the structure does not endanger persons and property downstream.

F. Shaw Dam

The spillway at this dam should be enlarged. At the right abutment there is a poor condition wherein surface water washes over the natural earth and causes the formation of a gulley. This condition has been pointed out to the Board of Selectmen in the past and they are aware that it exists. Nothing has been done to increase the spillway capacity nor has the right abutment area been improved other than the formation of a small roadside berm to deflect surface wash from enlarging the gulley.

G. Wales Woolen Co. Dam

This structure has been breached for many years, the opening is wide and deep. No pond is formed and conditions are satisfactory at the site.

H. Sagalyn Dam (Now Town of Wales)

Conditions at this dam are the same as reported last year. A man-made breach thru the masonry wall is very wide and deep. The breach is clean and clear and the brook flows freely thru the opening. No water would be ponded by the structure in time of heavy brook flow.

I. Zabawa Dam

This dam was in the same general condition as reported in previous years. No change has taken place. The entertainment area in which the dam is located was again found to be closed and locked up this year. No sign of activity in the area. It would appear that the Owner does not now plan any major expansion or increase in the size of the dam as was once discussed with the undersigned. As existing, the dam does not come under County jurisdiction. It is checked annually, however, to be certain that it is not enlarged without the filing of proper plans and specifications.

J. Norcross Dams

Each dam, situated on the property of Mr. Norcross at the Tupper Wild Life Sanctuary was inspected in the presence of Mr. Begg, Manager of the property. Conditions as noted at each of the dams owned by Mr. Norcross are as follows:

Dam No. 1 This structure was found to be in excellent condition. Water was stored to the level of the spillway and the new spillway was functioning very well. The embankment is in excellent condition and a good growth of sod is being encouraged.

Dam No. 2 This dam was found to be in very good condition. It is well maintained and safe. Water was stored to the level of the spillway overflow. The spillway masonry was excellent.

Dam No. 3 This dam was found to be in very good condition. The embankment is in satisfactory shape and well maintained. The spillway masonry was found to be excellent. The dam was considered safe when inspected.

Dam No. 4 The embankment was found to be in very good condition. This embankment is quite wide and provides a very high freeboard. Spillway facilities were clean and clear and operating.

Pond Hole Dam The embankment at this small dam was found to be in excellent condition. Spillway masonry was also excellent.

Vinica Pond Dam Conditions at this dam were in general the same as those noted and reported a year ago. The embankment was found to be in excellent condition. Maintenance has been good. The pond was full to the level of the spillway overflow. The spillway masonry was in excellent shape. No debris was found in the spillway facility. The side spillway was in excellent condition.

Trout Pond Dam This dam was found to be in very good condition.
The spillway was operating and satisfactory.

Respectfully submitted

GHM/cmb

George H. McDonnell
County Hydraulic Engineer

Aug. 22, 1962

Board of Selectmen
Town Office
Wales, Mass.

Gentlemen:

In accordance with Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that the dam forming Lake George has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

" This dam was found to be in satisfactory condition. The entrance to the spillway structure was clear and clean of any debris. Stoplogs in the masonry structure were at a grade whereby the top of the upper stoplog was level with the top of the concrete masonry in which the stoplogs set. The embankment is in good condition. An examination of the culvert indicates the presence of large loose boulders and some debris. This culvert should be inspected from time to time and all debris, loose boulders or any object that would interfere with the flow of water should be removed. "

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wales
August 22, 1963

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts

Gentlemen:

A. Lake George Dam

The concrete overflow inlet structure was in very good condition. Stoplogs were in place to the top of the masonry section of the overflow. The logs appeared to be firm and in good sound condition. Water level in storage was at the crest of the upper stoplog.

The embankment and the road on the embankment are both in good condition.

The spillway conduit was relatively free of debris and in reasonably good condition. The structure was considered safe when checked.

B. Squires Dam

This dam was in the same general condition as reported last year. The embankment consists of the highway fill and the spillway is nothing more than the culvert under the embankment of the roadway. Inlet to the culvert is a small masonry structure and it was found to be in satisfactory condition. The embankment was sound and stable. The dam was considered safe when checked.

C. D. S. Maynard Dam

This dam was in the same general condition as reported a year ago. The structure is small and though quite dilapidated, it is not considered to be any threat to persons and property downstream. The quantity of water stored

is small. Based upon present conditions, it is estimated that the drainage area involved is not much more than a quarter of a square mile. The height of the dam is only four feet and it is doubtful if the structure impounds more than one-half million gallons of water.

In view of these facts, it is the opinion of the undersigned that the dam no longer comes under County jurisdiction. At the time of the inspection, the embankment was being cleared of weed growth and appeared to be in satisfactory condition.

Since this structure does not come under County control and since it does not present any danger to persons and property, it is recommended that this dam be dropped from the inspection routine.

D. Shaw Dam

The embankment at this dam was found to be satisfactory. It is reasonably well shaped and wide for its height. The masonry at the spillway was found to be in fair condition. Abutment areas of both the spillway and the roadway bridge over the spillway were satisfactory.

In past years, it was pointed out to the Board of Selectmen of Wales, the owner of the dam, that the spillway capacity should be increased. Since the Town has been so notified in the past, there seems to be no need to notify the Town again. There is little chance that this dam will ever be washed out but should a major flood occur, it is possible that debris collecting under the bridge might restrict the spillway capacity and cause water to flow over or around the embankment of the dam. Even so, there is little chance that the loss of the stored water, added to a major flood flow, would be much of a contributing factor to downstream damage.

E. Wales Woolen Co. Dam

This dam has been breached for many years. The opening is wide and deep. No pond is formed and conditions at the site are satisfactory. The area that was once covered by ponded water is overgrown with brush and trees.

Since this dam has been breached and abandoned for many years and since there is little chance that it will ever be reactivated, there appears to be no further need to conduct inspections at this site and it is recommended that this dam be dropped from the inspection routine.

F. Sagalyn Dam (Now Town of Wales)

This dam is in the same general condition as reported previously. A man-made breach through the masonry wall still exists and the breach is deep

and wide. No water is ponded. The site should be inspected annually for a few more years and if no change occurs in that length of time and there is no evidence then that the dam will ever be reactivated, the structure could be dropped from the inspection list.

G. Zabawa Dam

No changes have taken place at this dam since the time of the last inspection. The entertainment area in which the dam is located was again found to be closed and there appeared to be little sign of any activity in the general area. The dam as existing does not come under County jurisdiction. When it was constructed, the owner was of the opinion that he might increase the dam to provide for increased storage of water. However, since little activity is ever noted at this entertainment area and since no change has been made in the past few years, it is not expected that the structure will be enlarged. It is inspected annually to be certain that the dam remains a small structure outside of County jurisdiction or that the owner, if he ever wishes to enlarge the structure, files proper plans and specifications.

H. Norcross Dams

Each dam situated on the property of Mr. Norcross at the Tupper Wild Life Sanctuary was inspected in the presence of Mr. Begg, Manager of the property. All dams were found to be in good condition and the report on each structure is as follows:

Dam No. 1 The embankment of the dam was found to be in good condition. Spillway masonry was excellent and no erosion was noted at the discharge end of each of the two spillway sections. No evidence of seepage was noted at the toe of the embankment areas. Fish screens were in place on the spillways and they were clean. The spillway bridge has not as yet been constructed. Water level in storage at the time of the inspection was at the crest of the spillway.

Dam No. 2 The embankment at this dam was found to be in excellent condition. The spillway was also in excellent condition and water level in storage was at the crest. The spillway chute was well maintained and the stone masonry was in good condition. No seepage was noted at the toe of the embankment sections of this dam. A fish screen was in place on the spillway but it was clean and properly maintained.

Dam No. 3 This dam was found to be in good condition. The embankment was well shaped and maintained. The spillway and its related chute were

satisfactory. The upstream ends of the spillway bridge wing walls were noted to be breaking up a bit, but this condition is not serious. Maintenance will be done on this masonry during the year. Water level in storage at the time of the inspection was at the crest of the spillway.

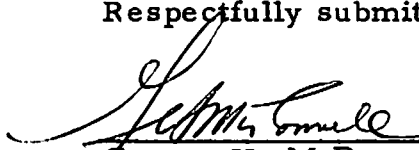
Dam No. 4 The embankment of this dam was in excellent condition. The spillway chute was satisfactory. A small fish screen in the spillway was in need of cleaning and this condition was pointed out to Mr. Begg. Also, the spillway chute is becoming overgrown with brush at its discharge end and Mr. Begg agreed to have it cleaned. Water level in storage was quite low.

Pond Hole Dam The embankment and spillway of this very low and small dam were both found to be in good condition. Water level in storage was very low. Spillway chute was okay and the masonry was in excellent condition.

Vinica Pond Dam The embankment at this dam was in excellent condition. The main spillway and the side spillway were okay. Fish screens were found to be in place in both spillways but they were clean and well maintained. Water level in storage was just at the crest of the spillway. Little water flowed over either of the two spillways. No seepage was noted at the toe of the embankment sections.

Trout Pond Dam The embankment and the spillway of this small dam were both in good condition. Water level was at the crest of the spillway. A fish screen in the spillway crest was clean and well maintained. No seepage was noted through or at the toe of the embankment.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wales
September 18, 1964

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Recent inspections of dams situated within the Town of Wales have now resulted in all dams in that community having been examined at least once during the year 1964. The following is a report on the conditions noted at each dam within Wales.

A. Lake George Dam

The inlet masonry structure at the spillway was found to be in good condition. Stoplogs were in place to the top of the masonry portion of the spillway crest. The stoplogs were sound and satisfactory.

The embankment area carrying the main roadway was found to be in good condition. The road paving is well maintained and the wide grassed area contains a good growth of sod. This dam is very wide for its low height.

The spillway conduit thru the dam was relatively free of debris.

B. Squires Dam (Now Morgan)

The spillway structure which serves as an inlet to the highway culvert was found to be in satisfactory condition. The masonry is sound and there was no sign of erosion or wear on the concrete. Water level in storage was down about 6" from the crest of the overflow. The culvert thru the embankment that carries the main roadway was clean and clear of any debris. The dam embankment itself was in very good condition.

C. D. S. Maynard Dam

In the report of a year ago, the undersigned pointed out that this dam could probably be dropped from the inspection schedule. However, on making what I thought might be a final inspection this year, I found the dam to be greatly improved. The area between the road and the dam embankment has been filled in and graded to about roadway level. The dam embankment itself has been cleared of all brush growth and a good sod is being developed over the entire surface of the earth fill. The steel tube spillway was found to be clean and clear of debris and functioning satisfactorily.

Since work has been done on this dam, there is a possibility that the owner might increase its height to obtain more pond storage. If this should be done, then the structure would fall under the jurisdiction of your Board. Since there is a highway culvert immediately downstream, the undersigned will continue to inspect this dam and keep it on the active list of the inspection schedule.

This dam was found to be in better condition this year than noted in many past years.

D. Shaw Dam

This dam was in the same general condition as noted last year. One stoplog was found to be out of the notch in the concrete spillway and water level in storage was down about 6" below the crest of the concrete wall. Normally, the stoplogs are kept to the level of the wall and the concrete becomes the lip of the overflow spillway.

The earth embankment section was found to be satisfactory. Abutment areas at the spillway and supporting the bridge across the spillway were okay. Little to no toe seepage was noted.

This dam is owned by the Town of Wales and your Board has made recommendations in the past regarding the advisability of increasing spillway capacity. There seems to be no need to point this out again this year. Since the dam stores a small quantity of water, loss of the dam in time of flood flow would not endanger persons and property downstream. However, it would mean the loss of the Town roadway carried across the dam. Though the spillway capacity is not adequate for an extremely heavy runoff condition, there is very little chance that the capacity of the spillway will ever be exceeded.

E. Wales Woolen Co. Dam

This dam has been breached for many years and the opening thru the embankment is very wide and deep. No pond has been formed for some time and the area that was once covered by water is now overgrown with brush and sizeable trees.

A recommendation was made a year ago that this dam site be dropped from the inspection schedule. However, since it is directly above the Sagalyn Dam, next herein reported, and since the undersigned passes the site to get to the Sagalyn Dam, inspections of the breach will be continued until such time as inspections at the Sagalyn Dam are terminated.

F. Sagalyn Dam (Now Town of Wales)

This dam was found to be in the same condition as reported a year ago. A man-made breach thru the masonry structure is wide and deep and prevents the formation of a pond. The opening thru the concrete masonry is clean and clear of any debris.

G. Zabawa Dam

This dam was in the same general condition as noted last year. On the day of inspection, Sept. 11, the entertainment area at which the dam is located was again found to be closed and there appeared to be little sign of any activity in the general area. The dam forms a small pond for aesthetic and boating purposes. At one time, the owner had planned to enlarge the dam so that the pond formed would cover a larger area. The site is inspected annually to be certain that the enlargement is not made without proper plans being filed.

The dam was considered safe when inspected and in the opinion of the undersigned, it is not large enough as yet to be under jurisdiction of your Board.

H. Norcross Dams

Each dam situated on the property of Mr. Norcross at the Tupper Wild Life Sanctuary was inspected in the presence of Mr. Begg, Manager of the property. All dams were found in relatively good condition. Some minor maintenance was recommended to Mr. Begg and this work is noted hereinafter in the individual reports on the dams involved.

Dam No. 1 This dam was in excellent condition. Both spillways were operating and a thin sheet of water passed the crest. Abutment areas of the two spillways were okay. A fish screen was in the crest of each spillway and each of the two screens were clear of any debris.

The three earth embankment sections of this dam were well shaped and stable. Little to no toe seepage was noted.

The spillway bridge has not as yet been constructed and it is not expected it will be built for some time. This bridge has no effect on the safety of the dam.

Dam No. 2 The spillway was found to be in very good condition. Water level in storage was down about 4" below the spillway crest. The large fish screen was in place on the spillway and it was free of any debris. The embankment of this structure was in excellent condition. It was found to be well shaped, covered with a reasonably good growth of turf and the stone paved areas were well maintained. No toe seepage was noted at this dam.

Dam No. 3 This dam was in the same general condition as reported a year ago. On the day of inspection, water level was just at the crest of the lowest spillway notch. The upper end of the left spillway wingwall reported as in need of maintenance a year ago has not as yet been fixed. This matter was pointed out to Mr. Begg and he said he would take care of it within the coming year. The condition at this wingwall is no worse than it was a year ago and the safety of the dam is not endangered by its condition.

The fish screens at this dam were free of any debris.

Dam No. 4 The embankment of this dam was found to be in excellent condition. However, at the spillway, the channel to the spillway notch and downstream thereof was fairly well plugged with weed and small brush growth. Mr. Begg agreed to clean out the channel shortly. Water level in storage was lower than I have ever seen it before. The pond formed by the dam was fairly well overgrown with aquatic vegetation. The fish screen in the spillway was nearly completely plugged with debris. Mr. Begg will clean the screen.

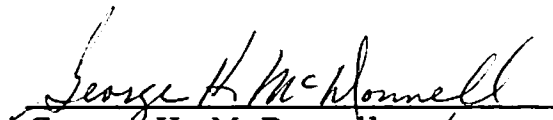
Pond Hole Dam The embankment and spillway at this dam were in very good condition. Water level in storage was down about one foot below the

small spillway crest. The masonry of the spillway itself and the chute downstream thereof was in excellent condition. Maintenance work had been done recently on the access road to this dam and at the right end of the embankment itself.

Vinica Pond Dam The embankment of this dam was in excellent condition. The main spillway and the side spillway were both okay. Fish screens were found to be in place in both spillways and they were clean of any debris. Water level in storage was at the crest of the spillway structures. No seepage at the toe of the embankment was noted.

Trout Pond Dam The embankment and spillway of this dam were found to be in very good condition. The pond was nearly empty since Mr. Begg had opened the drain valve. The pond is being emptied for cleaning purposes. The entire structure was found to be well maintained.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

CD Wales
December 21, 1964

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Reference is made to the list of unfinished dam cases sent to me earlier in the year for recommendations regarding the status of these dams. The Lower Pond, also known as the Northerly Pond, at Tupper Hill Wild Life Sanctuary in Wales was damaged in the flood of August, 1955. The owner decided to rebuild the dam and to improve the spillway capacity of the structure by the addition of a second spillway. On November 23, 1959, plans and specifications of the proposed work were filed with your Honorable Board together with a petition requesting permission to do the proposed construction work.

On February 24, 1960, your Board issued an Interlocutory Decree approving the filed plans and specifications.

The work was carried on shortly thereafter and in my annual report dated September 9, 1960, on the condition of dams in Wales, it was pointed out that construction work on the dam and new spillway at Lower Pond was progressing satisfactorily.

In my annual report on the condition of dams in the Town of Wales dated October 18, 1961, it was noted that all work had been completed on the construction of the new spillway except for the roadway bridge and the dam itself was in excellent condition.

Since all subsequent inspections have noted that the dam was found to be in very good condition, it is recommended to your Honorable Board that this structure be accepted.

Respectfully submitted,

George H. McDonnell

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wales
November 7, 1966

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

The undersigned has now completed the inspection of all dams situated within the Town of Wales and each and every dam in that community has been inspected at least once during the present year. The following is a report on the conditions noted at each dam situated in Wales.

A. Lake George Dam

The embankment forming this dam and carrying the main road was found to be in good condition. It is quite wide for its shallow height. At the spillway inlet all of the masonry construction was noted to be in good condition. Stoplogs were in place up to the top of the masonry stoplog wall. On the day of inspection, Friday, November 4, a fairly high rate of overflow was occurring from the lake as a result of the recent precipitation. The inlet to the conduit through the embankment and under the road was surcharged but at the outlet end of the conduit, water was flowing only about one-half the depth of the conduit. When the high rate of flow decreases to a low flow, probably as cold weather occurs and precipitation in the form of rain decreases, the conduit should be checked to be certain that there is no debris lodged in the conduit. It seemed to the undersigned that the discharge capacity of the conduit is being restricted.

B. Squires Dam (Now Morgan)

The dam embankment was found to be in good condition. As in the case of the Lake George Dam, this embankment carries a main road and is quite wide for its shallow height. The spillway inlet was found to be in satisfactory condition. The stone

masonry headwall was good but there was a crack noted in the right concrete wall of the spillway inlet. This crack is not serious as yet.

Brush has been cut from the embankment in the area of the spillway. In the opinion of the undersigned, the dam was satisfactory. Water was overflowing the spillway on the day of inspection.

C. D. S. Maynard Dam

This dam was about in the same condition as noted previously. In the opinion of the undersigned, it still does not come under County jurisdiction. Since it could be raised and the quantity of water impounded increased, the structure is inspected from time to time.

The earth embankment was found to be in fair condition but it is quite rough in shape and has a relatively low freeboard. Some seepage was noted through the toe of the embankment and leakage occurred along the outside of the large tube spillway in the embankment.

Because of the shallow depth of water and low height of the dam, the structure does not endanger persons and property downstream.

D. Shaw Dam

This dam has not been changed in any way since the time of the last inspection. Water was overflowing the spillway when the dam was checked. There were no flashboards on the concrete masonry wall spillway. The abutment areas were in fair condition. The stone masonry wall forming the main downstream portion of the dam is rough in shape but was noted to be satisfactory. Concrete masonry was okay.

Bridge abutments supporting the highway bridge over the dam spillway were both found to be satisfactory.

In the opinion of the undersigned, this small dam needs added spillway capacity. This recommendation has been passed on to the Town of Wales in the past and there seems to be no need to point this out again.

E. Wales Woolen Company Dam

This dam has been breached for many years. The breach is wide and deep and no water is stored whatsoever at the site. Since the dam is located adjacent to the main highway leaving Wales, the site is inspected annually to be certain that the breach is not plugged.

F. Sagalyn Dam (Now Town of Wales)

The dam was found to be in the same condition as reported previously. The man-made breach through the masonry structure is wide and deep. No pond is formed by the dam. The breach through the concrete masonry structure was clear of any debris.

G. Zabawa Dam

This dam was inspected at the time the dams in Brimfield were checked. The dam still is small and does not come under County jurisdiction. The pond formed is quite shallow.

The dam is situated in a recreation and entertainment area which appears to have been abandoned. The various small buildings and structures are becoming dilapidated and there was no sign of any person in the area when the inspection was made.

H. Norcross Dams

Every dam situated on the property of Mr. Norcross at the Tupper Wild Life Sanctuary was inspected in the presence of Mr. Begg, Manager of the property. All dams were found to be in relatively good condition. Some minor maintenance was recommended to

Mr. Begg, particularly at the No. 1 or downstream dam. Here the surface of two of the embankment sections were found to be quite sandy and somewhat soft. It was recommended that a good growth of turf be developed on these two embankment sections. Conditions noted at each of the dams are listed as follows:

Dam No. 1

The three embankment sections of this dam were found to be in satisfactory condition with the exception that at the central embankment and the left embankment the surfaces were noted to be sandy and soft. It was recommended to Mr. Begg that these surfaces be improved through the development of a good growth of turf.

The spillway masonry was noted to be okay. Fish screens were in place and were clean. Water was overflowing the crest of each of the two spillway sections. The toe areas of the embankments were satisfactory.

The spillway bridge has not as yet been constructed and it is not expected that it will be built in the near future. The bridge has no effect on the safety of the dam.

Dam No. 2

The embankment of this dam was found to be in very good condition. The turf cover was noted to be good to fair. The spillway structure was okay. The stone masonry was noted to be in very good condition. No flashboards were on the crest and water level was overflowing the crest.

The spillway fish rack was in place and clear of any debris.

No toe seepage was noted whatsoever. The emergency spillway tubes were clear.

Dam No. 3

This dam was found to be in satisfactory condition. The embankment was okay. No toe seepage was noted whatsoever and the two emergency spillway tubes were clear of any debris. The spillway was functioning, no flashboards were on the crest. The masonry of the spillway was in very

good condition. The fish rack on the spillway crest was clear of any debris.

Cover on the embankment consists mainly of shrub and small bush growth. The cover is satisfactory.

Dam No. 4

The embankment of this dam was found to be in very good condition. It is quite wide for its shallow height. The spillway was operating and water was overflowing the crest. This is the first time the spillway was noted to be in operation for many years. Runoff noted was the result of the recent heavy precipitation. The spillway channel was free of brush growth. No toe seepage was noted along the downstream toe of the embankment. The embankment surface, particularly on the downstream side, was quite sandy but a special shrub and plant growth is being developed to prevent erosion on the embankment surface.

Pond Hole Dam

This very small dam was in the same general condition as noted previously. The small embankment was in good condition. Water level in storage was down about six inches from the crest of the spillway. This pond is the only one of all of the ponds and lakes on the property that was not overflowing. The masonry of the spillway structure was okay. No toe seepage was noted whatsoever.

Vinica Pond Dam

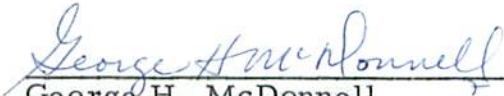
The embankment and both spillways were found to be in satisfactory condition. No toe seepage whatsoever was noted along the bottom of the downstream side of the embankment. Some leakage was noted at the drawdown gate discharge but this is not a serious condition. The embankment surfaces were noted to be okay and masonry of both spillways was good. In general, this dam is in excellent condition.

Trout Pond Dam

This small dam located upstream of Vinica Dam was found to be in satisfactory condition. Spillway masonry was good. No flashboards were on

the crest; and though the bar-rack had a small amount of debris collected on it, the condition was not bad. No toe seepage was noted. Water was overflowing the spillway crest for the first time in a number of years. It was noted that the structure was fairly well maintained.

Respectfully submitted,



George H. McDonnell
County Hydraulic Engineer

GHM/app

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wales
July 23, 1968

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

The undersigned has now completed the inspection of each dam situated within the Town of Wales. Every dam in that community has been inspected at least once during the year 1968. The following is a report on the conditions noted at each dam situated in Wales.

A. Lake George Dam

The embankment forming this dam was found to be in satisfactory condition. The embankment is very wide for its relatively shallow height and carries a main paved highway across its length. The upstream slope of the embankment is paved with cobblestones at the shoreline. The paving is in good condition.

Grass cover on the downstream portion of the embankment was in good condition. No toe seepage whatsoever was noted along the length of the embankment.

The intake to the spillway was satisfactory. Normal stoplogs were in place in the slots. Water level in storage was passing over the top of the upper stoplog.

One large log, probably a portion of an old tree trunk, is lodged in the spillway opening and should be removed. If high water causes this log to move into the spillway, it may become caught within the conduit itself. The Town of Wales should be advised to remove the log from the spillway inlet.

The conduit thru the embankment was found to be satisfactory and free of debris. The discharge end was o. k.

B. Squires Dam (Now Morgan)

The dam embankment was found to be in satisfactory condition. The paved roadway along the length of the embankment was good and there was no evidence of cracking or settlement. The slopes of the embankment were o. k. The spillway tube was in satisfactory condition. It was free and clear of any debris. The small inlet to the spillway was in satisfactory condition. The stone and concrete masonry of the inlet is in need of minor attention but the structure is safe as existing. No toe seepage was noted along the length of the embankment.

As in the case of the Lake George Dam, the embankment is quite wide for its shallow height. In the opinion of the undersigned, this dam is safe and in satisfactory condition.

C. D. S. Maynard Dam

This dam is in the same general condition as reported previously. In the opinion of the undersigned, it still does not come under County jurisdiction. The amount of water stored is small and the drainage area is less than a square mile. The height of the dam is only about 4 feet. However, the dam could be raised and the quantity of water impounded by the structure increased, and consequently the dam is inspected periodically when the routine inspections are made in the Town of Wales.

The dam embankment was noted to be in fair condition. It is quite rough in shape and has relatively low freeboard. Leakage also occurs along the outside of the large spillway tube passing thru the embankment.

While the dam is somewhat dilapidated, in the opinion of the undersigned, it is safe.

D. Shaw Dam

The spillway at this dam was noted to be in fair condition. Water level in storage was about 1 inch above the top of the concrete wall forming the crest. No flashboards were on the crest.

The right abutment area is in fair condition. There is some erosion of soil but the condition is not bad.

The earth embankment section of the dam is in fair condition. The paved roadway across the top shows no sign of settlement or cracking. The dry stone masonry wall forming the downstream face of the embankment is in good condition. Hardly any toe seepage was noted below the dam or at the base of the wall. The roadway bridge over the spillway appeared to be in satisfactory condition.

Though this dam should have additional spillway capacity as pointed out in previous communications, the undersigned is of the opinion that the structure is safe. Any extreme overflow of water could pass over the dam or around the structure without causing loss of the dam.

E. Wales Woolen Co. Dam

This dam has been breached for many years. The breach is wide and deep and no water whatsoever is stored at the site of the old dam. The pond area is entirely overgrown with trees.

There seems no need for further inspections at the site of this old, abandoned and breached dam. Unless your Honorable Board gives the undersigned instructions to the contrary, no further inspections will be made at the site of this old and breached dam.

F. Sagalyn Dam (Now Town of Wales)

This dam was found to be in the same condition as reported previously. The man-made breach thru the masonry structure is wide and deep. Flood flows can safely pass the dam without ponding water. No pond whatsoever is formed by the dam.

In the opinion of the undersigned, this dam could be dropped from the list of dams and no further inspections at the site seem necessary. Unless instructed otherwise, the undersigned will no longer inspect and report on the condition of this dam.

G. Zabawa Dam

No change has been made at this dam since the time of the previous inspection. The dam still does not come under County jurisdiction. The pond formed is small in area and quite shallow.

The dam is situated in a recreation and entertainment area which appears to have been abandoned by the owner. The various small buildings and structures are becoming dilapidated and there was no sign of any person in the general area of the dam on the day of inspection, July 5, 1968.

H. Norcross Dams

Each dam situated on the property of Mr. Norcross at the Tupper Wild Life Sanctuary was inspected in the presence of the assistant to the Sanctuary manager. All dams were found to be in good condition. Some minor maintenance was recommended to the assistant manager at the time of the inspections. Needed work was pointed out to him. This work is of a minor nature and, in general, has to do mainly with repairs to the stone masonry at certain areas of the dam.

Dam No. 1

The three embankment sections forming this dam were found to be in satisfactory condition. Improvements have been made to the embankments. New bridges have been constructed over the two twin spillways and these connect the three embankment sections.

The slopes of the embankment sections were satisfactory. Little or no toe seepage was noted.

Spillway masonry was satisfactory. Fish and trash screens were in place on the crest of each spillway and were clear of any debris. Water was overflowing the crest of each spillway at the time of inspection.

Dam No. 2

The embankment forming this dam was in very good condition. It is covered with a good growth of turf. The emergency spillway tubes were good and clear of any debris. The spillway itself was in good condition. The masonry did not need any attention. The fish and trash rack was in place on the crest of the spillway. No stoplogs were in the crest. Water level in storage was passing over the spillway. No toe seepage whatsoever was noted along the bottom of the embankment.

Dam No. 3

This dam was in satisfactory condition. The embankment is very good. The plant growth cover on the upstream slope and the small tree growth, together with plant growth, on the downstream slope gives the embankment good protection from erosion. The side slopes of this dam embankment are quite flat. No toe seepage at all was noted.

The spillway was in satisfactory condition. The masonry was generally good but some minor repairs are needed and these will be taken care of. Water level in storage was at the crest of the spillway. The bar rack on the crest was clear and clean of any debris.

Dam No. 4

Some minor masonry repairs are needed at the upper end of the left spillway wall. These were reviewed with the assistant manager and repairs will be done later this summer. The spillway structure itself was satisfactory. No stoplogs were in place and a low trickle of water passed thru the channel spillway.

The embankment itself was in good condition. This embankment is very wide for its low height and has flat side slopes. The road on top is in good condition and there is no sign of settlement. The side slopes are planted with various plants and erosion is controlled quite well. In the opinion of the undersigned, this dam is in good condition in spite of minor needed masonry repairs mentioned previously.

I. Pond Hole Dam

The stone masonry wall forming the major portion of this dam was in very good condition. It is a low, small wall, forming a very shallow pond. The spillway consists of a notch in the wall with a spillway channel across the earth embankment. The spillway was in good condition.

No toe seepage of any consequence was noted. The earth section of this small dam was satisfactory.

J. Vinica Pond Dam

The embankment forming this dam was found to be in good condition. It had a good turf cover. The gravel road along the top of the embankment was satisfactory and there was no evidence of any settlement. Toe seepage at this dam was normal. A small amount of seepage does occur but there is no movement to the water.

The main spillway was operating. There were no flashboards on the crest. The trash rack was in place and was clean.

The side spillway with its wooden rack was in satisfactory condition.

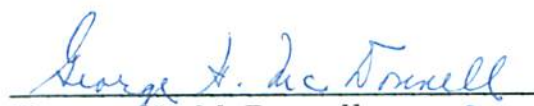
Some minor masonry repairs are needed at this dam and they will be taken care of later this summer.

K. Trout Pond Dam

This small dam was found to be satisfactory. Both the upstream and the downstream masonry walls were in good condition. The spillway structure was satisfactory. The bar rack was clear of any debris. A small amount of seepage was noted at the toe of the wall to the left of the spillway, but the quantity of water involved is very small and there is little or no motion to this water.

The roadway across the top of the dam is satisfactory and there is no evidence of any settlement. In the opinion of the undersigned, this small dam is in very good condition.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

**TIGHE
& BOND**

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
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CONSULTING ENGINEERS

BOARD AND FIELD OFFICES
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-0001

CD Wales
March 18, 1969

Tupper Hill Wildlife Sanctuary
Wales,
Massachusetts

Attn: Mr. Begg

Gentlemen:

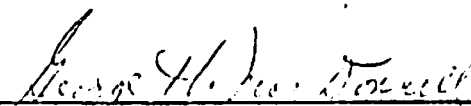
Reference is made to your dams in the Town of Wales, and the fact that there now exists a heavy snow cover throughout Western Massachusetts. The water content of this snow cover, coupled with a warm spring rain could result in extremely heavy runoff conditions. Consequently, the Commissioners of Hampden County have directed that I advise you to be sure that the spillway facilities at your dams are clear of any obstruction and that you take all precautions necessary to protect your dams as well as persons and property downstream.

Please be sure that all spillways are clear of any debris and that flashboards and stoplogs are removed until after the spring heavy runoff occurs. In removing any flashboards or stoplogs, release the stored water under controlled conditions so as not to endanger downstream property as a result of temporary flooding.

The dams and related spillways should be inspected frequently during the coming spring runoff period to be sure that the spillways are operating satisfactorily and that there is no interference with spillway operation as a result of debris.

If you have any question in connection with this matter, the undersigned can be reached at the above address and telephone number.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/amd

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wales
December 1, 1969

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

The undersigned has completed the inspection of each dam located within the Town of Wales. Every dam in that community has now been inspected at least once during the year 1969. The following is a report on the conditions noted at the dams in the Town of Wales.

A. Lake George Dam

The embankment forming this dam was found to be in good condition. It is very wide for its height. The stone paved surface of the sloping side towards the lake was noted to be in good condition. There is some tree growth on the sloping face but the trees are small and they do not reduce the safety factor at the dam.

The toe area on the dry side of the embankment is o.k. and no seepage was observed.

The spillway inlet was in good condition. Stoplogs were in the slots to the normal elevation at the top of the concrete masonry. A new coarse metal trash rack has been installed in front of the spillway opening to prevent the entrance of floating debris into the spillway conduit. This rack was clean and any debris collected has been removed. The rack is built in such a way that should debris plug the rack, water can still spill over the top if the level of the lake rises.

The spillway conduit was in good condition and there was no debris in the conduit. At the discharge end no erosion of any consequence was observed in the bed of the brook.

The grass cover on the major portion of the embankment was in good condition. No settlement or cracks in the roadway were observed.

**TIGHE
& BOND CONSULTING ENGINEERS**

In the opinion of the undersigned, this dam is in good condition and is safe.

B. Squires Dam (now Morgan)

The embankment of this dam was in good condition. As in the case of the Lake George dam, the embankment carries a town roadway.

The embankment is fairly massive in relation to its relatively low height. No cracks or settled areas were observed on the roadway.

The toe area of the embankment was observed to be dry.

The concrete and stone masonry spillway which also acts as an inlet structure to the conduit which passes under the roadway, was in good condition. No stoplogs were on the crest of the spillway and water level in storage was at crest elevation. There was no debris at the crest.

The spillway tube passing thru the embankment and under the roadway was in good condition. It was clear and on good alignment. The discharge end was o.k. and no brook bed erosion was observed.

In the opinion of the undersigned, this dam is safe.

C. D. S. Maynard Dam

This dam still does not come under County jurisdiction. It is inspected from time to time since it is located near the center of Town and very little time is required to view the dam.

The spillway tube was clear of any debris and was operating. The pond was full to spillway invert elevation. The embankment had a good thick sod cover of fairly long grass. The embankment is rough in shape, but because it is low in height and has a good sod cover, it is generally considered to be in satisfactory condition.

Inspections will continue to be made from time to time to be certain that the dam is not increased in size whereby a much larger quantity of water might be stored.

TIGHE & BOND

CONSULTING ENGINEERS

D. Shaw Dam

This old stone masonry structure with a concrete crest is in fair condition. The abutment areas are fair except for the fact that at the right side, surface water erosion is washing away soil on the right bank of the valley directly in front of the stone masonry of the dam. On the day of inspection surface water runoff was further eroding this area. The erosion should be controlled by diverting the surface runoff to another area or by leading the surface runoff into the brook via a tube or paved waterway. Should the erosion continue to a point where the soil is washed out deep enough to reach the end of the stone masonry of the dam, the road itself will be endangered. Water will be washing soil from the end and then from behind the stone masonry. This could result in a condition which might lead to dam failure.

A minor amount of work in the near future will undoubtedly prevent the need for more expensive and difficult repairs at a later date.

No flashboards were on the concrete wall crest of the dam and water level in storage was just over the masonry crest. The toe area in the brook was noted to be o.k.

In the opinion of the undersigned the dam is safe. However, the Town should take steps to correct the reported erosion problem.

E. Zabawa Dam

There has been no change made at this dam since the time of the previous inspection. The dam is not under County jurisdiction. The pond formed is very small and shallow. The dam is situated in an abandoned recreation and entertainment area which has been closed for a number of years. The entire area is deteriorating. The various small buildings and structures in the vicinity of the dam have become quite dilapidated and are collapsing. There is no evidence of any person having been in the general area for a long time.

F. Norcross Dams

Each dam located on the property of Tupper Wildlife Sanctuary was inspected on November 5, 1969. All of the dams were found to be in good condition. A report on the individual dams is as follows:

TIGHE & BOND CONSULTING ENGINEERS

Dam No. 1

The embankment at this dam is in good condition. It has a gravel top surface and side slopes covered with a thin grass growth. This growth is improving with each passing year. The toe area of each embankment section was noted to be dry and normal.

The bridge over the double spillway is in excellent condition.

Both spillways were in good condition. Fish racks were on the crest as well as underneath the bridge at the approach to each of the two spillway sections. The racks were relatively clear of leaves and debris.

The concrete and stone masonry was in good condition. The toe area of each spillway section in the bed of the brook was good and there was no sign of erosion.

Water level in storage was at the crest of each of the two masonry spillways.

The dam is generally in good condition and is considered safe.

Dam No. 2

The embankment forming this dam was in very good condition. The slopes are well grassed. The gravel roadway across the length of the embankment was in good condition. There was no settlement or cracking of the roadway. The toe area of the embankment was dry.

Emergency spillway tubes were clear of any debris and the individual tubes were in good condition.

The main spillway was noted to be in excellent condition. Stone masonry is maintained properly. Fish screens were on the approach to the spillway and were clear of any debris.

Water level in storage was overflowing the crest of the permanent spillway.

In the opinion of the undersigned, this dam is safe.

Dam No. 3

The embankment forming this dam is excellent condition. The toe is dry. The road extending across the top of the embankment was good. There was no evidence of settlement or cracking.

TIGHE & BOND CONSULTING ENGINEERS

The upstream surface of the embankment has a very good and thick cover of vegetation. The downstream slope is tree covered but the trees are still quite small and their presence does not endanger this dam embankment in any way.

The spillway masonry was found to be in excellent condition. Fish screens were in place and were clean. Water level in storage was overflowing the stone masonry crest of the spillway.

Emergency spillway tubes were clean and in operating condition.

Dam No. 4

The small spillway at this dam was in satisfactory condition. The stone masonry of the spillway was fair. It is in need of some minor attention. However, this spillway is very small, has a small head, and even though it were in poor condition, it would be safe. A fish screen was on the spillway crest. It is in fair condition and was reasonably clean.

The main embankment of the dam was in good condition. The toe is quite wet but this is typical for this installation. The toe has always been wet.

The dam embankment is large in mass for its height. A very good and well maintained gravel road extends the length of the embankment. No settlement or cracking of the roadway was noted. No brush or tree growth whatsoever was noted on the embankment slopes. There is special vegetation covering the embankment and this vegetation is good.

On the day of inspection the pond was full to spillway crest elevation and the dam was considered safe when inspected.

Pond Hole Dam

This dam is a very small dam impounding an insignificant quantity of water on a drainage area of only a few acres. The quantity of water stored is very small and the height of the dam is but a couple of feet. The dam does not come under County jurisdiction at all. It has been inspected from time to time, at the request of the Sanctuary manager, to give him advice on maintenance. In view of the fact that it is not inspected on each inspection trip and does not come under County jurisdiction, no further reports will be made on Pond Hole Dam.

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Vinica Pond Dam

This dam was noted to be in very good condition. The toe area is relatively dry. The grass cover over the surface of the embankment, particularly the sloping surfaces, is not too thick but is improving. The embankment is well shaped and there is no surface erosion at all. The gravel road extending across the top of the embankment is in very good condition. No settled areas were noted.

The spillway was in good condition. The stone masonry construction is very well maintained. There is a fish screen in place which was partially plugged with leaves. This condition is not dangerous since the screen is relatively low in height and any sizeable increase in water level in Vinica Pond would overflow the top of the fish screen.

The auxiliary side spillway was in good condition. The masonry was satisfactory and the small fish screen on the crest of this spillway was cleaned by the undersigned on the day of inspection.

Water level in storage was about 4" above normal elevation. Water was overflowing both the main and the auxiliary spillway.

This dam is in good condition and is safe.

Trout Pond Dam

This very small stone masonry and earth embankment dam was in relatively good condition. The spillway was o.k. Water level in storage was at the crest elevation and a clean fish screen was on the crest.

The small earth embankment was in good condition. The road across the top of the dam was o.k. No toe seepage was noted at the downstream edge of the embankment.

This small dam is directly above Vinica Pond. Any loss of Trout Pond Dam would do absolutely no damage downstream. Vinica Pond is very many times larger than Trout Pond and it could absorb the full amount of water stored in Trout Pond without raising Vinica Pond water level more than a couple of inches.

In the opinion of the undersigned, Trout Pond Dam is safe.

**TIGHE
& BOND CONSULTING ENGINEERS**

Wales Fish & Gun Club Dam

This is a small dam located southerly of Holland Road on a brook that is a tributary to Wales Brook. It has been inspected from time to time in the past and notes have been kept on its condition. It is located in a relatively undeveloped valley and is only separated from the main valley of Wales Brook by Holland Road.

The drainage area involved is slightly under 0.90 of a square mile. The height of the dam is 9 feet from the bed of the stream to the top of the uppermost portion of the structure. The estimated volume of water stored by the dam at spillway crest elevation is very close to 1,000,000 gallons. Thus, the dam is a borderline dam and it is thought advisable that it be inspected periodically and official records of its condition maintained. Any increase in height of the dam of a foot or more would definitely result in the structure coming under County jurisdiction.

The dam was noted to be in satisfactory condition. The left part of the embankment is well maintained. It has a reasonably good sod cover and there is no brush growth. The portion of the embankment to the right of the spillway has some brush and tree growth. This growth will be observed from time to time and if it becomes quite thick and thus dangerous to the safety of the dam, a recommendation will be made that it be cut.

The toe area at each earth embankment section was noted to be relatively dry.

The spillway concrete notch and the stone masonry side walls of the spillway structure were o.k. A fish screen and stoplogs were in the notch of the spillway and these were satisfactory. Water level in storage was at full elevation.

In the opinion of the undersigned, the dam is safe.

Respectfully submitted,

George H. McDonnell
George H. McDonnell
County Hydraulic Engineer
S.E.

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

**TIGHE
& BOND**

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

*Scanned
John A. Wales
1 - 1 Wales
7/15/70
3370*

CD Wales
August 18, 1970

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

The undersigned has now completed the inspection of each dam located within the Town of Wales. Every dam in that community has been inspected at least once during the year 1970. The following is a report on the conditions noted at the dams in Wales.

A. Lake George Dam

The embankment forming this dam was noted to be in good condition. It is very wide for its height. The main highway along the top of the embankment was in good condition. There were no settled areas or cracks in the pavement.

The stone paving along the shoreline of the water slope was satisfactory. Water level in storage was about normal. Stoplogs were in slots up to the top of the concrete sidewalls. Water level was just below the top of the stoplogs with small waves lapping over the upper stoplog. The bar rack in front of the stoplogs was clear and clean. It was noted to be in very good condition.

There was no debris on the rack whatsoever and the spillway conduit opening was clear of any debris.

The surface of the embankment was in good condition. The slope toward the lake contains many small trees but these trees do not endanger the dam. The downstream slope is a very gentle and

gradual slope that extends for a considerable distance beyond the paved roadway. The surface of the slope is partially turf and partly gravel. There was no evidence of erosion. The toe of the embankment was dry.

Examination of the discharge end of the spillway conduit showed the facility to be in satisfactory condition.

In the opinion of the undersigned, the dam is in good condition and it is safe.

B. Squires Dam (now Morgan)

The embankment forming this dam is in very good condition. As in the case of the Lake George Dam the embankment is quite wide for its low height. A main roadway extends along the top of the embankment and there were no settled areas or cracks in or on the roadway pavement.

The spillway inlet was in satisfactory condition. Water level in storage was just below the crest. There were no flashboards on the crest. The inlet was clear and clean of any debris.

Tree growth on the upstream face of the embankment and along the shoreline is becoming quite thick. However, the tree growth is small and because of the large width of the embankment, the trees do not endanger the dam.

The spillway culvert was noted to be o.k. It was clean and contained no debris. The discharge end was satisfactory.

The culvert headwall is a part of the spillway structure.

An examination of the toe of the embankment showed the toe to be dry.

C. D. S. Maynard Dam

This dam is in exactly the same general condition as previously reported. The dam still does not come under County jurisdiction. It is inspected from time to time however, since it is located near the center of town and very little time is required to view the dam.

The embankment is covered with a thick growth of fairly long grass and weeds. Though the embankment is rough in shape, it is low in height and impounds a very shallow pond.

D. Shaw Dam

This dam is in the same general condition as reported in previous years. The old stone masonry structure receives little attention or care. The abutment areas are in fair condition except for the fact that at the right side, surface water erosion is washing away the soil from the right bank directly in front of this right stone masonry wall of the abutment. Erosion should be controlled by diverting this surface runoff to another area or by leading the surface runoff into the brook by means of a tube or paved waterway. Should the erosion continue to a point where the soil is washed out deep enough to reach the end of the stone masonry of the dam, the road itself may then be endangered.

A minor amount of maintenance work in the near future will no doubt prevent the need for more expensive and possibly more difficult repairs at a later date.

There were no flashboards on the concrete crest wall. Stoplogs in the opening of the concrete crest wall were noted to be in poor condition.

In the opinion of the undersigned, consideration should be given in the near future to enlarging the spillway capacity at this dam. This could be done by removal of a part or all of the concrete wall on top of the old stone masonry spillway and replacement of this wall with a combination of a smaller wall and flashboards. As the drainage area upstream of the dam develops and the rate of runoff changes, the possibility of a flood flow exceeding the capacity of the spillway may be experienced. The cost of providing a better spillway facility would not be great and the roadway as well as the dam might be saved from destruction by flood flows if the spillway capacity is increased.

E. Zabawa Dam

There has been no change at this dam for a number of years. The dam is not under County jurisdiction. The pond formed is very small and shallow. The dam is situated in an abandoned recreation and entertainment area which has been closed for a number of years.

The area is deteriorating. There is no evidence of any person having been in the general area for some time.

F. Norcross Dams

Each of the dams located on the property of Tupper Wildlife Sanctuary was inspected on the afternoon of Wednesday, August 12th in the presence of Mr. Robert Begg, the manager and supervisor of the sanctuary. All of the dams were found to be in good condition. Some minor repair work is needed and this work will be taken care of. The minor repair work needed is pointed out in the report on each of the applicable dams.

Dam No. 1

The embankment forming this dam is in good condition. The twin spillways were o.k. except at the right side, downstream end of the concrete apron of the left spillway, there is an open space between the end of the apron and the heavy riprap in the bed of the brook. This open space extends up under the concrete apron. Mr. Begg was advised to mix up concrete, a little on the wet side, then pour it into the opening between the end of the concrete apron and the heavy riprap stones so as to fill the voids. He should then work the wet concrete up underneath the apron. This will prevent further deterioration and further erosion while at the same time it will provide for support to the end of the concrete apron that now is undermined.

Water level in storage was at the crest of the spillway. Screens were in place on the crest and they were reasonably clean.

No brush is growing from any portion of the earth embankment sections of this dam. The toe area of each earth embankment section was dry.

In the opinion of the undersigned, this dam is safe.

Dam No. 2

The embankment was found to be in good condition. There was no brush growth at all on the embankment. The toe area was perfectly dry. The embankment is well shaped.

The spillway was in good condition. The wooden bar rack was clean. Water level in storage was slightly below the crest of the spillway.

The stone masonry spillway chute and the spillway steps were o.k.

The emergency twin spillway pipes laid thru the dam embankment were o.k. They were clear of any debris or obstruction.

The slopes of the earth embankment are well grassed and stabilized.

In the opinion of the undersigned, this dam is safe.

Dam No. 3

The embankment forming this dam was noted to be in excellent condition. It has a good cover of vegetation. The toe area was observed to be dry.

The spillway was o.k. and the wooden bar rack on the spillway was clear and clean of any debris. Water level in storage was about a foot below the elevation of the permanent crest of the spillway.

The gravel road across the top of the dam was in good condition. There were no settled areas or evidence of any cracking. The emergency spillway tubes were examined and found to be clear and clean of any debris.

The upstream end of the stone masonry wall forming the left side of the spillway, pond side of the spillway crest, is broken and the individual stones have settled and broken away at the joints. Mr. Begg will have the end of this masonry wall repaired. The failure of the few stones does not affect the safety of the dam.

In the opinion of the undersigned, this dam was in satisfactory condition.

Dam No. 4

The small spillway of this dam at the far left end of the dam embankment was in satisfactory condition except for the fact that the wooden bar rack is quite dirty and plugged with vegetation. Mr. Begg will have the bar rack cleaned.

The embankment is very well shaped and it is quite wide for its shallow height. The surface of this embankment has been planted with special vegetation that is growing well and in spite of numerous bare areas between the planting areas, there is no evidence of surface erosion.

The gravel road extending along the top of the dam embankment was found to be in good condition.

The toe area is dry.

The drawdown facility at the right end of the dam embankment was in satisfactory condition. Some minor masonry repair work is needed but the work is of a routine nature.

Vinica Pond Dam

The embankment forming this dam was observed to be in excellent condition. It has been well maintained. The toe area is dry. All surfaces of the embankment have been well trimmed and are covered with a good growth of turf.

The gravel road extending along the top of the embankment is in good condition and there is no evidence of any cracking or settlement anywhere.

The spillway is in good condition. There is a minor amount of seepage thru the cemented stones of the spillway floor but this has always occurred and is of no consequence.

Water level in storage was at an elevation just below the crest of the spillway. There were no flashboards on the spillway. The wooden bar rack at the spillway crest was clean and in good condition.

At the small spillway to the left of the main dam, debris and stumps were observed floating in the inlet channel to the spillway. Mr. Begg will have these removed and will clean the bar rack and the entrance to the spillway itself.

In the opinion of the undersigned, this dam is in very good condition and it is safe.

Trout Pond Dam

This small dam was in the same general condition as reported last year. The spillway was satisfactory. Water level in storage was at the crest elevation and the fish screen was clean.

The small earth embankment was in satisfactory condition. The road across the top of the embankment was observed to be o.k. No toe seepage was noted whatsoever at the downstream edge of the embankment.

As previously pointed out, this small dam is directly above Vinica Pond and any loss of Trout Pond Dam would do no damage whatsoever downstream. Vinica Pond is very many times larger than Trout Pond and this lower pond could easily absorb the full discharge of water stored in Trout Pond without raising Vinica Pond water level more than one or two inches.

In the opinion of the undersigned, the small Trout Pond Dam is in good condition and it is safe.

G. Wales Fish and Gun Club Dam

This small dam is located southerly of Holland Road on a brook that is a tributary to Wales Brook. The dam is inspected from time to time and notes have been kept relative to its condition. It is located in a relatively undeveloped valley and is only separated from the main valley of Wales Brook by Holland Road.

It is doubtful that this dam comes under County jurisdiction. It has been pointed out previously that the height of the dam is about 9 feet above the bed of the stream and the drainage area involved is under 9 tenths of a square mile. The estimated volume of water stored by the dam at spillway crest elevation is close to 1,000,000 gallons. Any increase in height of the dam would naturally increase the quantity of water stored and the structure would then come under County jurisdiction by virtue of its height and volume in storage.

On the day of inspection the pond was found to be nearly empty. Stoplogs were in the spillway notch and the stoplogs are poor. They were leaking badly and the full flow of the stream passed thru the joints in the stoplogs.

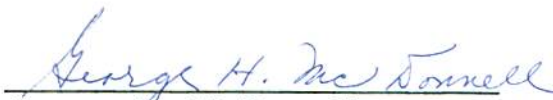
The spillway masonry was in fair condition.

The two earth embankment sections of the dam are satisfactory. The earth embankment section to the left of the spillway is in better condition than the earth embankment section to the right of the spillway. The right portion is becoming overgrown with brush and small trees while the left portion is maintained somewhat by cutting of brush and the development of a grass cover.

The area appears to be abandoned. There was no sign of any recent use of the pond. This may be due to the small amount of water in storage. However, with proper and tight stoplogs in the spillway slots, the water might have been retained. Thus, it is possible that the members of the club do not make use of the pond following the spring season of each year. The undersigned has never seen anyone at the pond during inspections.

In the opinion of the undersigned, though the dam is not too well maintained, it is safe.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd

West Springfield - Specifications for Piper Recreational Dam - 1956



1956 Reports

Specifications filed March 8, 1956 for Piper Recreational Dam, Parks & Recreation Commission, West Springfield, by Tighe & Bond.

City/Town	West Springfield
Dam	Piper Recreational Dam

No. #3 66

d25 097

SPECIFICATIONS
FOR
PIPER RECREATIONAL DAM
PARKS & RECREATION COMMISSION
TOWN OF WEST SPRINGFIELD, MASS.
MARCH - 1956
Tighe & Bond, Inc., Consulting Engrs.
189 High Street...Holyoke, Mass.

Filed - March 8, 1956

See "Special Provisions" Page
for County Commissioners
Approval of Specifications.

PARKS & RECREATION COMMISSION
TOWN OF WEST SPRINGFIELD, MASS.

* * * * *

RE-ADVERTISEMENT FOR BIDDERS

Sealed Proposals for the construction of Piper Recreational Dam will be received by the Parks & Recreation Commission until 7:30 P.M., Eastern Standard Time, on Monday, March 5, 1956, at their office on the second floor of the Town Hall, West Springfield, Mass., and at that time and place publicly opened and read aloud. Proposal Guarantee: \$500.00. Performance and Payment Bond; 100%. Plans and Specifications obtainable at the office of Tighe & Bond, Inc. Consulting Engineers, 189 High Street, Holyoke, Mass., for deposit of \$10.00. Full deposit returnable to bidders; 50% of deposit returnable to non-bidders. Plans to be returned within seven days after bid opening. Minimum wage rates established. Rights reserved to waive informality in or reject any or all proposals or accept proposal deemed most satisfactory to Owner, if it be in the public interest so to do.

TOWN OF WEST SPRINGFIELD

Parks & Recreation Commission.

PROPOSAL FORM



**TIGHE & BOND
CONSULTING ENGINEERS
HOLYOKE, MASS.**

PROPOSAL
TO THE
PARKS & RECREATION COMMISSION
TOWN OF WEST SPRINGFIELD, MASS.
FOR THE INTERSECTION OF
PIPER ROAD AND AMOSTOWN ROAD

* * * * *

The undersigned as bidder declares that the only person or parties as principals interested in this proposal are named below; that this proposal is made without collusion with any other person, firm or corporation; that he has carefully examined the location of the proposed work, has taken into consideration all the difficulties likely to be met with in the doing of the work; that he also has carefully examined the annexed form of Contract and the plans therein referred to and entitled:

"PIPER RECREATIONAL DAM
PARKS & RECREATION COMMISSION
TOWN OF WEST SPRINGFIELD, MASS.

Tighe & Bond, Consulting Engineers
Holyoke, Mass."

and he proposes and agrees that he will contract with the Town of West Springfield, in the form of Contract annexed, to provide all the insurance, labor, machinery, tools, apparatus and other means of construction and to do all the work and furnish all the materials specified in the Contract in the manner and time therein prescribed and in accordance with the requirements of the Engineer, as herein set forth and that he will take in full payment therefor the following sums, to wit:

ITEM NO.	ESTIMATED QUANTITIES	ITEMS WITH UNIT BID PRICE WRITTEN IN WORDS & FIGURES	AMOUNT OF ITEM	
			DOLLARS	CENTS
1.	400 Cu. Yds.	For each cubic yard of earth excavation made to prepare a foundation for the dam and for the conduit or for any other item on the job, as directed by Engineer, including all labor, equipment, and materials required for or incidental to the work, the sum of:		
			\$ _____	
			(\$ _____) per cu. yd.	

ITEM NO.	ESTIMATED QUANTITIES	ITEMS WITH UNIT BID PRICE WRITTEN IN WORDS & FIGURES	AMOUNT OF ITEM DOLLARS CENTS
2.	1100 Cu. Yds.	For each cubic yard of impervious fill, furnished, placed and compacted in the central core of the dam in accordance with these specifications and the engineer's instructions, including all labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) per cu. yard	\$ _____
3.	1100 Cu. Yds.	For each cubic yard of semi-pervious fill, furnished, placed and compacted in the upstream 1/3 of the dam, including all labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) per cu. yd.	\$ _____
4.	1100 Cu. Yds.	For each cubic yard of pervious fill, furnished, placed and compacted in the downstream 1/3 of the dam, including all labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) per cu. yd.	\$ _____
5.	300 Cu. Yds.	For each cubic yard of sand fill furnished and placed as hereinafter specified, or as directed by the engineer, including all labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) per cu. yd.	\$ _____

ITEM NO.	ESTIMATED QUANTITIES	ITEMS WITH UNIT BID PRICE WRITTEN IN WORDS & FIGURES	AMOUNT OF ITEM DOLLARS CENTS
6.	60 Cu. Yds.	For each cubic yard of concrete furnished in place in the completed work, in accordance with these specifications, including all labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) per cu. yd.	\$ _____
7.	2,000 Lbs.	For each pound of reinforcing steel furnished in place in the completed work, in accordance with these specifications, including all labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) per lb.	\$ _____
8.	900 Lbs.	For each pound of structural steel furnished in place in the completed work, in accordance with these specifications, including all labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) per Lb.	\$ _____
9.	150 Lbs.	For each pound of cast iron furnished in place in the completed work, in accordance with these specifications, including all labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) per Lb.	\$ _____

ITEM NO.	ESTIMATED QUANTITIES	ITEMS WITH UNIT BID PRICE WRITTEN IN WORDS & FIGURES	AMOUNT OF ITEM DOLLARS CENTS
10.	60 Lin. Ft.	For each lineal foot of 60" reinforced concrete, standard strength, culvert pipe, furnished and placed by the Contractor as hereinafter specified, including all jointing, labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) per Lin. Ft.	\$ _____
11.	18 Lin. Ft.	For each lineal foot of 16", Class 100 or better, cast iron pipe furnished and placed in the completed work, in accordance with these specifications, including specials, jointing, and all labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) per Lin. Ft.	\$ _____
12.	Lump Sum	For the furnishing and placing of a 16" low pressure, gate valve, and extension stem as shown on the plans and as hereinafter specified, including all labor, equipment, and materials required for or incidental to the work, the sum of:	
		(\$ _____) Lump Sum	\$ _____
13.	Lump Sum	For the furnishing and installing of a double-leaf, 16-foot wide gate in the existing chain link fence on the Amostown Road end of the dam, including locking device and all labor, equipment and materials required for or incidental to the work, the sum of:	
		(\$ _____) Lump Sum	\$ _____

ITEM NO.	ESTIMATED QUANTITIES	ITEMS WITH UNIT BID PRICE WRITTEN IN WORDS & FIGURES	AMOUNT OF ITEM DOLLARS CENTS
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14.	700 Sq. Yds.	For each square yard of loam- ing and fertilizing and seed- ing, furnished in place in accordance with the specifica- tions, including all labor, equipment and materials re- quired for or incidental to the work, the sum of:
-----	-----------------	--

(\$ _____) per Sq. Yd.

\$ _____

TOTAL AMOUNT OF BID - Items 1 to 14
inclusive

\$ _____

Alternate to Item 10.	60 Lin.Ft.	For each linear foot of 60" Lock Joint, Reinforced con- crete pressure pipe (see Art. 96) furnished and placed by the Contractor, as herein specified, including all jointing, labor, equipment and materials required for or incidental to the work, the sum of:
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(\$ _____) per Lin. Ft.

\$ _____

If this Proposal shall be accepted by the Town of West Springfield acting through its Parks & Recreation Commission, the undersigned Bidder agrees to meet the requirements of Article 62 regarding the date of beginning of work and he further agrees to the provisions of Article 67 and specifies that the job shall be substantially complete on Monday, June 4, 1956.

If this Proposal shall be accepted by the Town of West Springfield acting through its Parks & Recreation Commission, and the undersigned shall fail to contract as aforesaid and to give a Performance and Payment Bond in the sum of the full amount of the Contract, with a Surety Company satisfactory to

the Board within ten (10) days of the date of the notice to him from the Owner that the Contract is ready for signature, then he shall be considered to have abandoned the contract and the certified check for Five Hundred Dollars (\$500.) accompanying this proposal shall become the property of the Town of West Springfield.

DATED THIS _____ DAY OF _____ in the Year 1956.

SIGNATURE OF BIDDER: _____

Name of Bidder; _____

Business Address: _____

BY: _____

Residence: _____

In compliance with Article 5, Section B, the Bidder, if this bid is submitted by a firm, partnership or corporation, shall list required information below:

--

The proposed surety company on the Bond is to be as follows:

Name: _____

Address of Home Office: _____

Name & Address of Agent:

GENERAL REQUIREMENTS



**TIGHE & BOND
CONSULTING ENGINEERS
HOLYOKE, MASS.**

GENERAL REQUIREMENTS

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DEFINITION OF TERMS

Article 1. Definition of Terms.

Wherever in these specifications of other contractual documents the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as follows:

- Addendum An addition to or alteration of the Plans and/or Specifications generally issued for clarification purposes prior to the opening of proposals.
- Advertisement ... The notice published in newspapers and trade bulletins announcing the time and place for the opening of bids for work to be done.
- A.A.S.H.O. The American Association of State Highway Officials.
- Alteration Change in the form or character of any of the work done or to be done.
- A.S.T.M. The American Society for Testing Materials.
- Bidder Any individual, firm or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.
- Contractor A party to the contract, acting directly or through an authorized lawful agent or employee.
- Engineer The Consulting Engineer acting directly or through an authorized representative, such representative acting within the scope of the particular duties entrusted to him.
- Extra Work Work or materials not called for in the Plans and Specifications and which is deemed necessary for the proper completing of the improvement.
- Layout See Right of Way.
- Location See Right of Way.
- Material Any substance proposed to be used in connection with the construction of the project and its appurtenances.
- Owner The duly authorized official or officials in charge of the project.

Plans The contract drawings, Detail Sheets, or exact reproductions thereof, which show the location, character, dimension and details of the work including any alterations thereof permissible under the contract and authorized by duly approved written orders.

Proposal The written offer of the Bidder submitted in approved form to perform the work contemplated.

Project The purpose for which bids have been called and work contracted for.

Right of Way That area which has been laid out or acquired for the purpose of this project.

Special Provisions .. The special directions, provisions and requirements prepared to cover proposed work not satisfactorily provided for by these General Requirements. These special provisions shall be included within the general term "Specifications" and shall be made a part of the contract with the express purpose that they shall prevail over all other specifications.

Specifications .. The directions, provisions and requirements, designated as Specifications, together with all written agreements made or to be made pertaining to the method and manner of performing the work, or the quantities and qualities of materials to be furnished under the Contract. The Specifications shall include the Advertisement, Proposal Form, General Requirements, Standard Detail Drawings, Special Provisions, Addenda and Contract Form.

Work All performance, including the furnishing of materials, labor, tools, equipment and incidentals, required of the Contractor under the terms of the contract.

The Words "As directed", "as permitted", "as required" or words of like effect shall mean that the direction, permission or requirement of the Engineer is intended, and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean approved by or acceptable or satisfactory to the Engineer, unless otherwise provided herein. The words "necessary", "suitable", "equal" or words of like import shall mean necessary, suitable or equal in the opinion of the Engineer.

The words "approval of the Owner" or "approval by the Owner" shall mean approval either by vote of or in writing by the duly authorized officials.

PROPOSAL REQUIREMENTS AND CONDITIONS

Article 2. Contents of Proposal Forms.

Proposal forms consisting of the documents listed below will be furnished by the Owner to the bidder upon request at the office of the Engineer.

- A. The Specifications; including the Advertisement, General Requirements, Special Provisions, Standard Detail Drawings, Addenda, Proposal Form and Contract Form.
- B. The Plans.

Article 3. Interpretation of Basic Estimate of Quantities.

- A. All bids will be compared on the basis of the Engineer's estimate of quantities of work to be done, as shown in the Proposal.

These quantities are approximate only, being given as a basis for the comparison of bids, and the Owner does not expressly or by implication agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class, item or portion of the work, as may be deemed necessary or expedient by the Owner.

Bidders are required to submit their estimate upon the following express conditions, which shall apply to and become part of every bid received, viz:

An increase or decrease in the quantity for any item or group of items shall not be regarded as cause for an increase or decrease in the prices, nor in the time allowed for the completion of the work, except as provided in the contract. An increase or decrease in the quantity of work to be done shall not warrant any claim for loss, damage or anticipated profit.

B. The work has been divided into classes and items in order to enable the bidder to bid on the different portions of the work in accordance with his estimate of their cost, so that in the event of an increase or decrease in the quantities of any particular class of work the actual quantities executed may be paid for at the price bid for that particular class of work.

Article 4. Examination of Plans and the Location.

Statements as to the condition under which the work is to be performed, including plans, surveys, measurements, dimensions, calculations, estimates, borings, etc., are made solely to furnish a basis for comparison of bids, and the Owner does not guarantee or represent that they are even approximately correct. The Contractor must satisfy himself by his own investigation and research regarding all conditions affecting the work to be done and labor and material needed, and make his bid in sole reliance thereon. The Contractor should carefully examine any materials furnished

by the Owner, the location of the work, the difficulties likely to be met in doing the work and all other factors relating to the Project.

Article 5. Preparation of Proposals

A. Bid Prices.

The Bidder shall submit his proposal upon the blank forms furnished by the Owner. The bidder shall specify a unit price, in both words and figures, for each and every item for which a quantity is given, and shall also show the products of the respective unit prices and quantities, written in figures in the column provided for that purpose, and the total amount of the proposal obtained by adding the amounts of the several items. All words and figures shall be in ink. In case of a discrepancy between the prices written in words and those written in figures, the written words shall govern. In case of a discrepancy between the unit prices and the extended totals, the unit prices shall govern.

No bid will be accepted which does not contain a unit price for every item shown on the Proposal Form. No conditional bids will be accepted.

When an item in the Proposal contains a choice to be made by the bidder, the bidder shall indicate his choice in accordance with the specifications for that particular item, and thereafter no further choice will be permitted without permission from the Owner.

The price for any item, bid and/or contracted for, unless otherwise noted or specified shall include full compensation for all materials, equipment, tools, labor and incidental work, necessary to complete the item to the satisfaction of the Engineer. The prices shall, without exception, include all royalties and costs arising from patents, trademarks, and copyrights in any way involved in the work.

B. Signatures.

All proposals shall be signed correctly with ink in the proper places provided, as follows:

If the proposal is made by an individual, his name and post office address shall be given.

If the proposal is made by a firm, partnership or corporation it shall be signed by a person having such legal authority from the said firm, partnership or corporation and the person so signing the proposal shall give his own name and title (if any) in addition to the name and address of the firm, partnership or corporation.

If the proposal is made by a firm or partnership the names and addresses of the individual members shall be given.

If the proposal is made by a corporation, the name of the State under the laws of which the corporation was chartered and the names, titles and business addresses of the President, Treasurer and Manager shall be given.

Article 6. Delivery of Proposals.

Each Proposal shall be submitted to the Owner in a sealed envelope. On the outside of the envelope shall be written the bidder's name and address and the name of the project for which the bid is submitted.

If forwarded by mail, the sealed envelope containing the Proposal, and marked as directed above, must be enclosed in another envelope addressed to the Owner. The recommended method of mailing shall be "Registered-Return Receipt Requested."

Proposals received by the Owner at the designated place after the time designated in the Advertisement for Bidders will be returned to the bidder unopened.

It is the bidder's responsibility to see that his Proposal is at the designated place at the designated time. The Owner will not receive any Proposal not delivered to the designated place.

Article 7. Proposal Guaranty Required.

In order to insure the faithful fulfillment of its terms, each Proposal shall be accompanied by a certified check or lawful money as directed in the Special Provisions. Said check will be returned to the bidder unless retained by the Owner under the conditions hereinafter stipulated.

A bid bond will not be accepted as security.

Article 8. Public Opening of Proposals.

Proposals will be publicly opened and read aloud at the time and place indicated in the Advertisement for Bidders. Bidders or their authorized agents are invited to be present.

Article 9. Rejection of Proposals.

Proposals which fail to meet the requirements of Articles 5, 6 and 7, or which are incomplete, conditional or obscure, or which contain additions not called for, erasures, alterations or irregularities of any kind, or in which errors occur, or which contain abnormally high or abnormally low bid prices for any class of item of work, may be rejected as informal. The Owner may waive any informalities in or reject any or all bids and may accept any bid the Owner deems to be in his best interests or in the best interests of the group represented by the Owner.

More than one proposal from the same bidder, whether or not the same or different names appear on the signature page, will not be considered. Reasonable proof for believing that any bidder is so interested in more than one proposal for the work contemplated will cause the rejection of all proposals made by him directly or indirectly. Any or all proposals will be rejected if there is reason for believing that collusion exists among the bidders.

Bidders whose proposals have been rejected because of evidence of collusion as specified in Article 9 will not be considered in future proposals for the same work, and such bidders may be disqualified from bidding on future work.

Article 10. Withdrawal of Proposals.

Any bid may be withdrawn prior to the scheduled time for opening as shown in the Special Provisions or authorized postponement thereof.

No bidder may withdraw a bid within 30 days after the actual date and time of the opening thereof.

Article 11. Competency of Bidders.

No contract will be awarded except to responsible bidders capable of performing the class of work contemplated. Before the award of the contract, any bidder may be required to show that he has the necessary facilities, experience, ability and financial resources to perform the work in a satisfactory manner and within the time stipulated. If the contract contains special work of a complicated nature or if it contains items for materials or work the character of which will depend upon the Contractor's skill or experience, he will be required to show proof that he has a satisfactory record of similar work performed or materials furnished under other contracts. Bidders may be required to furnish the Owner with formal sworn statements as to their experience and their financial status.

Article 12. Material Guaranty.

Before any contract is awarded, the Bidder may be required to furnish without expense to the Owner a complete statement of the origin, composition and manufacture of any or all materials proposed to be used in the construction of the work, together with samples, which samples may be subjected to the tests required by the Owner to determine their quality and fitness for the work.

Article 13. Addenda and Interpretations.

No interpretation of the meaning of the plans, specifications or other contract documents will be made to any bidder orally. Every request for such interpretation should be in writing addressed to the office of Tighe & Bond, Consulting Engineers, 189 High Street, Holyoke, Mass., and to be given consideration must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed by registered mail with return receipt requested to all prospective bidders (at the respective addresses furnished for such purposes) not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve any bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

AWARD AND EXECUTION OF THE CONTRACT

Article 14. Consideration of Bids.

The Owner reserves the right to reject any or all proposals, to waive technicalities, and to advertise for new proposals, or proceed to do the work otherwise, as it may deem best for its own interests.

Article 15. Award of Contract.

The bids will be compared on the basis of the totals of the sums obtained by multiplying the Engineer's estimate of quantities by the unit price stated on the Proposal for each respective item.

The lowest bidders will be determined as described in the above paragraph. The responsible bidders will be determined as described in Articles 9, 11 and 12.

The Contract will be awarded to the lowest, responsible bidder as determined by the Owner.

The Contract will be awarded by the Owner as soon as practicable after the opening of bids. The successful bidder will be notified in writing, by mail, or otherwise, that his bid has been accepted and that he has been awarded the contract.

Article 16. Return of Proposal Guaranty.

The Proposal Guaranty will be returned to all except the three lowest formal bidders within three days after the opening of the bids. The Proposal Guaranty of each of the three lowest formal bidders will not be released by the Owner until after a Contract has been executed. Within three days after the signing of a Contract, the Proposal Guaranty of each of the three low bidders will be returned except as hereinafter provided.

The Proposal Guaranty submitted with any bid rejected as informal will be returned within three days of said rejection.

Article 17. Contract Bond Required.

Prior to the execution of the Contract, the Contractor will be required to furnish a surety bond in the amount specified in the Special Provisions as security for faithful performance of this Contract. The bond shall also guarantee payment of all persons performing labor on the project under this Contract and furnishing materials in connection with this Contract.

The bond must be in the usual and approved form and must also contain the following: "and shall pay for all labor performed or furnished and for all materials used or employed, and shall pay all persons who contract with the principal for labor and materials as provided in the

General Laws of Massachusetts, Chapter 149, then this obligation to be void, otherwise to remain in full force and effect."

Attorneys in fact who sign bid bonds or contract bonds must file with each bond a certified copy of their power of attorney to sign said bonds.

The surety is to be a bonding company or securities satisfactory to the Owner.

Article 18. Execution of Contract.

The Contractor to whom the contract is awarded will be required to appear at the office of the Engineer with the surety offered by him, and execute the contract within 10 calendar days from the date of the notice from the Owner or Engineer to the bidder that the contract is ready for signature. The contract shall be in writing on the forms provided.

Article 19. Failure to Execute Contract.

Should the successful bidder fail to execute the contract and furnish the contract bond insurance, as herein specified, within the time stipulated, the Owner may, at its option, determine that the bidder has refused to execute a Contract with the Owner. The Owner will consider the Proposal Guaranty forfeited by the Bidder. The Owner will then offer the Contract to the second lowest responsible Bidder.

SCOPE OF WORK

Article 20. Intent of Plans and Specifications.

It is the intent that the plans and specifications shall prescribe a complete work or improvement; and when the work is completed, the Contractor shall leave the job site in a neat and finished condition.

The Contractor shall do all the work and furnish all the materials, tools and appliances, except as otherwise specified, necessary or proper for performing and completing the work required by the contract, in the manner and within the time specified. He shall complete the entire work to the satisfaction of the Engineer, and in accordance with the specifications and drawings for the work, at the prices agreed upon.

All the work, labor and materials to be done and furnished under the contract shall be done and furnished strictly pursuant to, and in conformity with the specifications and the plans for the work, which said specifications and drawings shall form part of the contract, and also in accordance with the directions of the Engineer as given from time to time during the progress of the work, under the terms of the contract.

Article 21. Special Conditions.

Construction items or conditions anticipated for any proposed work, and not covered by these "General Requirements", will be described and specified in "Special Provisions". Said Special Provisions shall be

considered a part of the contract. In case of conflict between the said Special Provisions and General Requirements, the Special Provisions shall govern.

Article 22. Alteration of Work.

Should it be found desirable by the Engineer to make alterations in the form or character of any of the work done, or to be done, the Engineer may order such alterations to be made, defining them in writing, supplemented with drawings when in the opinion of the Engineer it is necessary, and the alterations shall be made accordingly; provided that in case such alterations increase the cost of the work the Contractor shall be remunerated at prices based on prices allowed on the same character of work under the specifications, and in case the alterations shall diminish the cost of the work no allowance will be made for anticipated profits.

In case of any alteration, change or addition to the work as originally contemplated, and if said alteration, change or addition justified an increase in the cost of the work, the Owner reserves the right to decide the method that will be used to determine said additional costs. (see Article 73.)

In case of any alterations, so much of the contract as is not necessarily affected by such alterations shall remain in force upon the parties thereto, and such alterations shall be made under the terms of and as a part of the contract, and the security for the performance of the contract shall in nowise be invalidated, but shall be held to secure in like manner the performance of the alterations made under the contract and of any extra work done under the provisions of Article 23.

The Contractor shall perform the work as increased or decreased within the qualifying limits named and subject to the provisions outlined above, but no allowance shall be made for any change in anticipated profits. Adjustments shall be considered waived unless specific complaint is made in writing by the Contractor previous to the construction of such alteration or change and within three calendar days following notice from the Owner of such alteration or change.

Article 23. Extra Work.

The Contractor shall do any work not herein otherwise provided for, when and as ordered in writing by the Engineer, such written order to contain particular reference to this article.

If the Contractor claims that any instructions from the Engineer involve extra cost or an extension of time, he shall so notify the Engineer in writing within three calendar days after the receipt of the Engineer's instructions and in any event before proceeding to execute the extra work. No claim from the Contractor will be considered valid unless made in accordance with the terms of this Article.

Such notice by the Contractor and the keeping of costs by the Engineer shall not in any way be construed as proving the validity of the claim.

Payment for extra work will be made in accordance with the provisions of Article 73.

The Owner may at any time, by a written order, and without notice to the Surety or Sureties, require the performance of such changes in the work as it may find necessary or desirable.

Article 24. Maintenance of Detours.

When required by the Owner, a project shall be closed to travel during construction. Suitable detours shall be provided and maintained as directed or as specified in the "Special Provisions" and in Articles 50 and 51. Payment for this work is to be included by the Contractor in his unit prices for the various items of work. No special payment will be provided unless otherwise stated under "Special Provisions."

Article 25. Removal and Disposal of Structures and Obstructions.

Existing structures such as bridges, culverts, dikes, walls, pipes, guard railing, fences, street railway ties and rails, found within the project limits on right-of-way, which are to be replaced or rendered useless by new construction shall be removed by the Contractor at his own expense unless otherwise provided in the Special Provisions. When their location is such as not to interfere with the work, the removal shall not be done until the new structures replacing them are ready for traffic or until the Engineer shall permit.

All material in existing structures requiring removal shall remain the property of the Owner. The material shall be removed without damage, in sections which will permit easy handling and disposal, to locations within the limits of the project, and convenient for their subsequent removal by the Owner, or as directed by the Engineer. All discarded material, rubbish or debris shall be removed from the work and disposed of as directed. No foreign material or debris shall be permitted to remain or move in a waterway.

Article 26. Rights in the Use of Materials Found on the Work.

The Contractor, with the approval of the Engineer, may take suitable ledge, gravel, sand, loam, clay or other material from within the location lines of the project under construction and use it for other purposes than for forming embankments. If such use necessitates securing additional material for forming embankments, the Contractor shall at his own expense, furnish an amount of borrow of a satisfactory quality, equal to the amount of material taken, as measured in excavation. The Contractor shall not excavate or remove any material which is not within the excavation as indicated by the slope stakes and grade lines, without written approval. No excavated material suitable for use shall be wasted, unless as directed.

Unless otherwise provided the material from any existing structure may be used temporarily by the Contractor during construction. Such material shall not be cut, bent, broken or otherwise damaged.

Nothing in the contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or the soil; but all such materials shall, upon being so attached or affixed, become the property of the Owner.

Article 27. Final Cleaning Up.

Upon completion of the work and before acceptance and final payment, the Contractor shall remove, at his own expense, from the project location and from adjoining property, all temporary structures and all surplus material and rubbish which may have accumulated during the prosecution of the work, and shall leave the work broom clean and in a neat and orderly condition. The Contractor shall clean up the job so that the condition of the site will be at least equal to its condition before work began.

No equipment or materials shall be left on the right-of-way or project limits without the written permission of the Engineers.

CONTROL OF WORK

Article 28. Authority of the Engineer.

The Engineer shall decide all questions which may arise as to the quantity, quality, acceptability, fitness and rate of progress of the several kinds of work to be performed and materials to be furnished under the contract, and shall decide all questions which may arise as to the interpretation of any part of the contract, especially the plans and specifications which are a part thereof, as to the fulfillment of this contract on the part of the Contractor, and the determination and decision of the Engineer shall be final and conclusive; and such determination and decision, in case any question shall arise, shall be a condition precedent to the right of the Contractor to receive any money hereunder.

Article 29. Plans and Detail Drawings.

Approved plans, profiles and sections on file in the office of the Engineer will show the location, details and dimensions of the work contemplated, and all work shall be in strict conformity therewith and with the specifications.

Supplemental plans and detail drawings as required in the specifications and furnished by the Contractor shall upon approval become a part of the complete plans. Such approval of supplemental plans or detail drawings, however, shall not be construed as a complete check and shall not operate to relieve the Contractor of any of his responsibility under the contract for the satisfactory completion of the work, nor for the accuracy of the dimensions, details or quantities or for their agreement.

When submitting detail drawings for approval, complete sets of prints as directed shall be furnished the Engineer who will return one set either approved or with corrections marked thereon. Finally, the Contractor shall

furnish the Engineer with complete sets of prints as directed of the corrected and approved detail drawings. No changes shall be made in the approved drawing without the written consent of the Engineer.

The contract price shall include the cost of furnishing all working drawings and the contractor will be allowed no extra compensation therefor. The Engineer will specify the number of sets of approved detail drawings that will be required.

Any work done or materials furnished by the Contractor prior to the approval of the working drawings shall be at his own risk.

Article 30. Conformity with Plans and Allowable Deviations.

The finished work shall conform in all respects to the lines, grades, cross sections and dimensions given on the approved plans. Where conditions make it necessary or desirable for major deviation from the approved plans, such changes shall be made as specified in Article 22 and 23, upon authorization in writing by the Owner.

Article 31. Co-ordination of Specifications and Plans.

The General Requirements, the Addenda, the Proposal Form, the Contract Form, the Plans, the Special Provisions, and all supplementary documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be cooperative; to describe and provide for a complete work. In case of disagreement, the Plans shall have precedence over the General Requirements and the Special Provisions shall govern over both the Plans and the General Requirements; figured dimensions shall govern over scaled dimensions.

Article 32. Co-operation by Contractor.

The Contractor will be given two copies of approved contract drawings, detail sheets, contract and special provisions. He shall have one copy of all such information and a copy of the specifications on the work and available for reference at all times during the prosecution of the work. He shall have at all times a competent and reliable superintendent or foreman on the work, authorized to receive orders and to act for him. Whenever the Contractor is not present on any part of the work when it may be desired to give directions, orders will be given by the Engineer and they shall be received and executed by the foreman or superintendent who is in charge of the particular work in reference to which the orders are given.

The Contractor shall provide all reasonable facilities to enable the Engineer to inspect the workmanship and materials entering into the work. He shall cooperate in the matter of setting and preserving stakes, bench marks, etc., for controlling the work.

The Contractor shall so carry on his work under the direction of the Engineer that public service corporations, or municipal departments may enter on the work to make changes in their structures or to place new structures and connections therewith without interference, and the Contractor shall have no claim for or on account of any delay which may be due to

or result from said work of public service corporations or municipal departments.

Article 33. Adjacent Contracts.

The Contractor shall carry on his work concurrently with that being done on other contracts or work (if any) adjacent to or in conjunction with the project, so as to provide for all possible cooperation towards the satisfactory completion of the work with a minimum of delay and inconvenience. Where necessary and insofar as possible he shall permit other contractors free and unobstructed passage over the work. He shall have no claim for or on account of any damage or delay due to the operations of other contractors or their movements over his section of the work.

Article 34. Construction Stakes.

The Contractor shall furnish, free of charge, all stakes and such temporary structures as may be necessary for marking and maintaining points and lines given by the Engineer for the building of the work, and shall give the said Engineer such facilities and materials for giving said lines and points as he may require; and the Engineer's marks shall be carefully preserved.

Article 35. Authority and Duties of Engineer's Assistants.

The Engineer may appoint such assistants and representatives as he desires and they shall be authorized to inspect work and materials, to give directions pertaining to the work or to the safety and convenience of the public, to approve or reject materials, to make measurements of quantities and to perform such other duties as may be designated by the Engineer.

In case of any dispute arising between the Contractor and the Engineer's assistants, as to materials furnished or the manner of performing the work, the Engineer's assistants shall have the authority to reject the materials or to suspend the work until the question at issue can be referred to and decided by the Engineer.

Engineer's assistants are not authorized to revoke, alter, enlarge, relax or release any requirements of these specifications, nor to issue instructions contrary to the plans and specifications. They shall in no case act as foreman or perform other duties for the Contractor.

Article 36. Inspection of Work and Materials.

The Engineer's agents and employees of the Owner may for any purpose enter upon the work and premises used by the Contractor and the Contractor shall provide safe and proper facilities therefor.

The inspection of the work shall not relieve the Contractor of any of his obligations to fulfill the terms of the Contract as herein prescribed by the plans and the specifications.

The Contractor shall furnish the Engineer or his authorized representative with every reasonable facility and assistance for ascertaining whether or not the work as performed is in accordance with the requirements and intent of the plans and specifications. If so directed, the Contractor shall, at any time, before the acceptance of the work, remove or uncover any portions of the finished work necessary for inspection. After the inspection the Contractor shall restore said portions of the work to the condition required by the specifications.

The Contractor shall furnish written information to the Engineer stating the original sources of supply and dates of manufacture of all materials manufactured away from the actual site of the work. In order to insure a proper time sequence for required inspection and approval this information shall be furnished at least two (2) weeks (or otherwise directed by the Engineer) in advance of the incorporation in the work of any such materials.

Failure to reject any defective work or materials shall not in any way prevent later rejection when such defect is discovered, or obligate the owner to make final acceptance.

Article 37. Removal of Defective or Unauthorized Work.

All defective work shall be removed, repaired or made good, notwithstanding that such work has previously been inspected and approved or estimated for payment. If the work or any part thereof shall be found defective at any time before the final acceptance of the whole work, the Contractor shall at his own expense make good such defect in a satisfactory manner.

Any work done beyond the lines and grades shown on the plans or as given, except as herein provided, or any extra work done without authority, shall be considered as unauthorized and at the expense of the Contractor. Such work will not be measured nor compensation allowed therefor. Work so done may be ordered removed at the Contractor's expense.

Upon failure of the Contractor to remove and satisfactorily dispose of any or all defective or unauthorized work, and to remedy the same after being so notified, the Engineer may cause such defective work to be remedied, removed and replaced, and such unauthorized work to be removed; and to deduct the costs therefor, from any moneys due or to become due the Contractor.

Article 38. Final Inspection.

Before any acceptance of the entire project the Engineer will make a complete final inspection of the work done.

If the work or any part thereof is not acceptable to the Engineer at the time of the final inspection, he shall notify the Contractor in writing of the particular defects or parts to be remedied before final acceptance. If the Contractor has not arranged within a period of five (5) days after the date of transmittal of such notice of nonacceptability, to complete the work speedily as described by the Engineer, the Engineer may without further notice and without in any way affecting the contract, make such other arrangements as he may consider necessary to insure the satisfac-

tory completion of the project. The cost of so completing the work shall be deducted from any moneys due or which may become due the Contractor under the contract.

CONTROL OF MATERIALS

Article 39. Source of Supply and Quality.

The source of supply of each material shall be approved by the Engineer before delivery is started.

The Contractor shall furnish all materials required for the work specified in the contract, and said materials shall meet the requirements of the specifications for the kind of work involving their use.

Only new and first quality materials, conforming to the requirements of these specifications and approved by the Engineer shall be used in the work. If, after trial, it is found that sources of supply which have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved material from other approved sources.

The Contractor may be required to furnish sworn certificates as to quality and quantity of materials before said materials are incorporated in the work.

Article 40. Samples and Tests.

Tests of materials will be made by the Board or under its direction. The Contractor shall furnish such facilities as the Engineer may require for collecting and forwarding samples, and shall not make use of, or incorporate in the work, any material represented by the samples until the required tests have been made and the material accepted. The Contractor in all cases shall furnish the required samples without charge. Where tests are required of materials already incorporated in the work, the Contractor shall furnish samples, cut from the completed work at a time and as directed by the Engineer. The area affected by the removal shall be replaced and refinished, and the Contractor will receive no special compensation for any of the aforesaid work.

Article 41. Delivery and Storage of Materials.

Materials and equipment shall be progressively delivered at the site so that there will be neither delay in the progress of the work nor an accumulation of material that is not to be used within a reasonable time.

Materials shall be stored at the expense of the Contractor so as to insure the preservation of their quality and fitness for the work. When considered necessary by the Engineer, they shall be placed on wooden platforms or other hard clean surfaces, and not on the ground, and shall be placed under cover when directed. Stored materials shall be so located as to facilitate prompt inspection.

Article 42. Defective Materials.

Materials not conforming to these specifications shall be rejected, and removed from the work by the Contractor as directed. No rejected material, the defects of which have been subsequently corrected, shall be used except with the permission of the Engineer. Should the Contractor fail to remove defective material within the time indicated in writing, the Engineer shall have the authority to remove and replace the defective material, and the cost of such removal and replacement will be deducted from any moneys due or to become due the Contractor.

LEGAL RELATIONS AND CONTRACTOR'S RESPONSIBILITY

Article 43. Laws to be Observed.

The Contractor Shall keep himself fully informed of all existing and future state and national laws and municipal ordinances and regulations in any manner affecting those engaged or employed in the work, or the materials used in the work, or in any way affecting the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the contract for this work in relation to any such law, ordinance, regulation, order or decree, he shall forthwith report the same to the Engineer in writing. He shall at all times himself observe and comply with, and shall cause all his agents and employees to observe and comply with, all such existing and future laws, ordinances, regulations, orders and decrees.

The Contractor shall comply with the provisions of Chapter 461 of the Acts of 1935. A table of the minimum wage rates is attached hereto.

The Contractor's attention is directed to the fact that all applicable State and Municipal Laws; and rules and regulations of all authorities having jurisdiction over the construction work in the locality of the project shall apply to the Contract throughout, and they are deemed to be included herein the same as though herein written out in full.

Article 44. Insurance Requirements.

A. Compensation Insurance for Workmen and Traffic Officers:

1. Workmen.

The Contractor shall, before commencing performance of the contract, provide by insurance for the payment of compensation and the furnishing of other benefits under Chapter 149, Section 34A and Chapter 152 of the General Laws, Tercentenary Edition, to all persons to be employed under the contract, and he shall continue such insurance in full force and effect during the term of the contract.

Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the contract and shall operate as an immediate termination thereof.

No cancellation of such insurance, whether by the insurer or by the insured, shall be valid unless written notice thereof is given by the party proposing cancellation to the other party and to the officer or agent who awarded the contract at least fifteen days prior to the intended effective date thereof, which date shall be expressed in said notice. Notice of cancellation sent by the party proposing cancellation, by registered mail, postage prepaid, with a return receipt of the addressee requested, shall be sufficient notice. An affidavit of any officer, agent or employee of the insurer or of the insured, as the case may be, duly authorized for the purpose, that he has so sent such notice addressed as aforesaid shall be prima facie evidence on the sending thereof as aforesaid. This section shall apply to the legal representatives, trustee in bankruptcy, receiver, assignee, trustee and the successor in interest of any such Contractor.

The aforesaid insurance shall be taken out and maintained at the Contractor's own expense.

2. Traffic Officers.

The Contractor shall take out and maintain at his own expense, insurance against damages arising from injury to special uniformed police, referred to in Article 58, while they are engaged in the performance of their duties. The coverage and provisions of such insurance shall be similar to those required to insure employees of the Contractor under the Workmen's Compensation Act, and shall be in addition thereto.

The aforesaid insurance shall be taken out and maintained at the Contractor's own expense.

3. Contractor's Public Liability and Property Damage Liability Insurance.

The Contractor shall furnish evidence to the Board that, with respect to the operations he performs, he carries Contractor's Public Liability Insurance providing for a limit of not less than a monetary value specified in the Special Provisions for all damages arising out of bodily injuries to or death of one person, and, subject to that limit for each person, a total limit of a monetary value specified in the Special Provisions for all damages arising out of bodily injuries to or death of two or more persons in any one accident, and Contractor's Property Damage Liability Insurance providing for a limit of not less than a monetary value specified in the Special Provisions for all damages arising out of injury to or destruction of property in any one accident and, subject to that limit per accident, a total (or aggregate) limit of a monetary value specified in the Special Provisions for all damages arising out of injury to or destruction of property during the policy period.

If any part of the work is sublet similar insurance shall be provided by or in behalf of the subcontractors to cover their operations.

Such property damage and public liability insurance as are provided under this Contract must cover all the various types and items of work that are to be undertaken. For the purposes of this Contract the insurance shall be considered to be in full effect from the date of signing of the Contract to the date of the final acceptance of the work.

Such public liability and property damage insurance as are provided under this contract must carry a clause or rider agreeing to "assume the defense of and indemnify and save harmless the Owner, together with his officers, employees and agents, from all suits, loss, cost or damage arising out of or attributable to claims related to the project."

Satisfactory proof of insurance coverage shall be given to the Owner. Three copies of the insurance certificate shall be furnished prior to the signing of the Contract. A complete policy will be furnished to the Engineer before the beginning of construction operations.

Failure to provide and continue in force, the property damage and public liability insurance during the life of this Contract shall be deemed a breach of the Contract and shall operate as an immediate termination thereof.

The aforesaid insurance shall be taken out and maintained at the Contractor's expense.

Article 45. Working Hours.

No laborer, workman, mechanic, foreman or inspector working within the Commonwealth, in the employ of the Contractor, sub-contractor, or other person doing or contracting to do the whole or a part of the work contemplated by the contract, shall be required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of emergency. Any contractor or sub-contractor for said department, may employ laborers, workmen, mechanics, foremen and inspectors for more than eight hours in any one day in such construction or reconstruction when, in the opinion of the commissioner of labor and industries, public necessity so requires.

Article 46. Rules for Employment of Labor.

The Contractor and all sub-contractors shall keep a true and accurate register of all mechanics, teamsters, chauffeurs and laborers employed thereon, showing the name, address, and occupational classification of each employee on said works, and the hours worked by, and the wages paid to each such employee, and shall furnish to the Massachusetts Department of Labor and Industries upon its request a true statement of the same. Such records shall be kept in such manner as the Commissioner of Labor and Industries shall prescribe, and shall be open to inspection by any authorized representative of the Department of Labor and Industries at any reasonable time and as often as may be necessary.

In the employment of mechanics, teamsters, chauffeurs, and laborers in the construction of public works by persons contracting or subcontracting for such works, preference shall first be given to citizens of the Commonwealth who have served in the army or navy of the United States in time of war and have been honorably discharged therefrom or released from active duty therein, and who are qualified to perform the work to which the employment relates; and secondly, to citizens of the Commonwealth generally, and, if they cannot be obtained in sufficient numbers, then to citizens of the United States. Every employee in the work covered by the contract shall

lodge, board and trade where and with whom he elects, and neither the Contractor nor his agents or employees shall directly or indirectly require as a condition of employment therein that an employee shall lodge, board or trade at a particular place or with a particular person. Attention of bidders is called to Section 148 of Chapter 149 of the General Laws, and acts in amendment thereof which require the weekly payment of employees.

Article 47. Permits and Licenses.

The Contractor shall procure at his own expense all permits and licenses, pay all charges and fees and give all notices necessary and due in connection with the lawful prosecution of the work.

Article 48. Patented Devices, Materials and Processes.

Whenever the Contractor desires to use any design, device, material, or process covered by letters patent or copyright, the right for such use shall be secured by suitable legal agreement with the patentee or owner, and a copy of this agreement shall be filed with the Owner.

Article 49. Sanitary Provisions.

The Contractor shall provide and maintain in a neat and sanitary condition such accommodations for the use of his employees as may be necessary to comply with the requirements of the Department of Public Health, local health officials or of other authorities having jurisdiction.

Article 50. Public Safety and Convenience.

The Contractor shall be responsible for the maintenance of traffic over, through or around the work included in his contract with the maximum of safety and practicable convenience to such traffic during the life of the contract, and whether or not work thereon has been suspended temporarily. He shall take all precautions for preventing injuries to persons or damage to property in or about the work. If the Contractor constructs temporary bridges or provides temporary crossings of streams, his responsibility for accidents shall include the roadway approaches as well as the structures of such crossings.

The work shall be carried on in such a manner as to provide safe passage at all times for public travel and with least obstruction to traffic. The convenience of the general public and of residents along and adjacent to the project shall be provided for in an adequate and satisfactory manner. The Contractor shall provide and maintain at his own expense (except as otherwise provided herein) in a safe and passable condition, such temporary by-passes and temporary bridges as may be necessary to accommodate traffic on and around the construction; and he shall provide and maintain, in a safe condition, temporary approaches to and crossings of intersecting highways.

Roads shall be closed to travel only as directed by the Engineer. Where the new construction coincides with the present traveled way, the Contractor shall so carry on his work that travel will not be obstructed.

The Contractor shall at all times so conduct the work that the abutters shall have reasonable access to their property as directed by the Engineer. When it is necessary to leave materials and equipment upon the highway they shall be placed so as to cause the least possible obstruction to pedestrians and other travel.

Work shall be carried on in such a manner as to provide for reasonable fire protection at all times.

When the work in any way affects the operation, management, maintenance, business or traffic on any railroad, such work shall be carried on in a manner satisfactory to the said railroad. The Contractor shall use all possible vigilance in order effectually to guard against all accidents or damages on the railroad due to his work, and the Contractor shall at all times during the progress of the work so manage and execute the same as to cause the least possible interference with the operation, management, business or traffic of the railroad.

In the event that the Contractor fails to comply with the provisions of this Article, then the Owner shall proceed to make such required improvements, detours, by-passes, etc., as he believes necessary. The Owner shall, at his own discretion, either proceed with said work immediately or after a suitable time limit specified in a notice to the Contractor. The cost of said work will be borne by the Contractor.

Article 51. Barricades, Warning Signs and Lights.

The Contractor shall at his own expense provide, place and erect all necessary barricades and warning signs and furnish and keep lighted all lights necessary to protect the work from traffic, pedestrians and animals. He shall also furnish at his own expense a sufficient number of watchmen at all times to protect the work.

Highways closed to traffic shall be protected by suitable barricades and warning signs, and the Contractor shall provide and maintain adequate lights and illumination therefor. He shall be held responsible for all damage to the work due to any failure of signs and barricades to protect the work properly from traffic, pedestrians, animals or other causes.

In the event that the Contractor fails to comply with the provisions of the Article, then the Owner shall proceed to make such required improvements, detours, by-passes, etc., as he believes necessary. The Owner shall, at his own discretion, either proceed with said work immediately or after a suitable time limit specified in a notice to the Contractor. The cost of said work will be borne by the Contractor.

Article 52. Protection and Restoration of Property.

The Contractor shall, at his own expense, preserve and protect from injury all property either public or private along and adjacent to the project, and he shall be responsible for and repair at his own expense any and all damage and injury thereto. He shall exercise special care during

his operations to avoid injury to underground structures such as water or gas mains, pipes, conduits, manholes, catch basins, etc. When necessary, the Contractor shall cooperate with representatives of public service companies in order to avoid damage to their structures by furnishing and/or erecting suitable supports, props, shoring or other means of protection.

Fire hydrants adjacent to the work at all times shall be readily accessible to fire apparatus and no material or other obstructions shall be placed within a radius of ten (10) feet of a fire hydrant.

Land monuments and property marks shall be carefully protected and if necessary to remove the same, he shall do so only at the Engineer's direction and after an authorized agent has witnessed or otherwise referenced their location. The Contractor shall not injure or remove trees or shrubs without proper authority. Insofar as possible the Contractor shall confine his movements and operations to the area within the limits of the location and the area outside the scope of the work shall not be disturbed except as directed.

Article 53. Responsibility for Damage Claims.

The Contractor shall take all responsibility for the work and take all precautions for preventing injuries to persons and property in or about the work; shall bear all losses resulting to him on account of the amount or character of the work, or on account of the weather elements or other causes, and the Contractor shall indemnify and save harmless the Owner and all of its officers, agents and employees against all suits, claims or liability of every name and nature, arising out of or in consequence of any acts of omission or neglect of the Contractor in the performance of the work covered by the contract and/or failure to comply with the terms and conditions of said contract, whether by himself or his employees or subcontractors.

Damage to materials furnished by the Owner or damage to the Owner's property, either now existing or constructed under this Contract, and all loss or deterioration occurring prior to the final acceptance of the work, and resulting from the Contractor's operations, shall be made good by the Contractor at no expense to the Owner.

Article 54. Contractor's Responsibility for the Work.

Until its final approval by the Owner, the Contractor shall assume full charge and care of the work and he shall take every necessary precaution against injury or damage to the work by action of the elements, or from any cause whatsoever, whether arising from the execution or the non-execution of the contract. The Contractor shall bear all losses resulting to him on account of the amount or the character of the work, or because the nature of the land in or on which the work is done is different from what was estimated or expected, or on account of the weather elements, or other causes.

The Contractor shall rebuild, repair, restore and make good at his own expense, all injuries or damages to any portion of the work occasioned by any of the above causes before the completion of the work and the accep-

tance of the contract. Issuance of an estimate on any part of the work done shall not be construed as final acceptance of any work completed up to that time.

The Contractor shall reimburse the Owner for all expenses, losses or damages, as determined by the Engineer, incurred by or in consequence of any defect, act, omission, or mistake of the Contractor or his employees.

The Contractor will be held responsible for any and all claims for damage to underground structures such as water or gas mains, pipes, conduits, manholes or catch basins, due to his operations or to the operations of any of his sub-Contractors.

Locations shown for existing underground pipes and utilities are approximate only, as determined from records, M-Scope surveys and field observations. The Contractor shall have no claim if any utility or pipeline is not shown in correct location or is present but not shown on the plans. The Contractor shall be responsible for notifying utility owners in reasonable advance of his work and he shall request of the utility owner, the staking out on the ground surface, of underground utilities and structure. The Contractor shall notify the Engineer, of any refusal or failure to stake out utilities after reasonable notice, and the Engineer and the Contractor will jointly take reasonable action to determine the location of the utilities before the beginning of excavation.

The Contractor shall contact all utility owners to determine if they have any buried pipes, cables, objects, etc. in the area of his work. Gas, Electric, gasoline, Telephone, Radio, water, Telegraph, oil, natural gas, Sewers, drains, fire alarm, ADT, etc. shall all be considered utilities herein.

Article 55. Claims Against Contractors.

The Contractor shall pay all bills for labor and materials contracted by him and for the rental of appliances and equipment hired by him for or on account of the work herein contemplated. The Owner may keep any moneys which would otherwise be payable at any time hereunder, and apply the same, or so much as may be necessary therefore, to the payment of any expenses, losses or damages incurred by the Owner and determined as herein provided, and may retain, until all claims are settled, so much of the moneys as the Owner shall be of opinion will be required to settle (1) all claims against the Owner and its officers and agents as specified in Article 53 and 54, and (2) all claims for labor performed or furnished, for materials used or employed in such construction or repair, including lumber so employed which is not incorporated in the construction or repair work and is not wholly or necessarily consumed or made so worthless as to lose its identity but only to the extent of its purchase price less its fair salvage value, and for the rental or hire of vehicles, shovels, Excavating and Backfilling equipment rollers propelled by steam or other power, concrete mixers, tools and other appliances and equipment employed, said claims having been filed with the County Treasurer or City or Town Clerk, in accordance with Section 29, Chapter 149 of the General Laws, as appearing in the Tercentenary Edition, as amended by Chapter 361 of the Acts of the year 1938, and all subsequent amendments thereto, or the Owner may make such settlements and apply thereto any moneys retained under the contract. If the moneys retained under the contract are insufficient to pay the sum due under the claims for labor and materials and for the rental of appliances and equipment filed as aforesaid,

the Owner may, at its discretion, pay the same, and the Contractor shall repay to the Owner all sums so paid. The Owner may also, with the written consent of the Contractor, use any moneys retained, due or to become due under the contract, for the purpose of paying for labor and materials and for the rental of appliances and equipment for the work for which claims have not been filed as specified above. It is understood that the security required by Section 29 of Chapter 149 of the General Laws, Tercentenary Edition, is obtained both by the bond accompanying the contract and by the power of the Owner to retain and pay money under the provisions of this article, but the release of one shall in no way impair or discharge the other.

Article 56. No Waiver of Legal Rights.

Neither the inspection by the Owner nor any of its employees or agents, nor any order, measurement or certificate by the Engineer, nor any order by the Owner for the payment of money, nor any payment for, or acceptance of, the whole or any part of the work by the Engineer or Owner, nor any extension of time, nor any possession taken by the Owner or its employees, shall operate as a waiver of any provision of the contract, or of any power herein reserved to the Owner or any right to damages herein provided; nor shall any waiver or any breach of the contract be held to be a waiver of any other or subsequent breach. Any remedy provided in the contract shall be taken and construed as cumulative, that is, in addition to each and every other remedy, herein provided; and the Owner shall also be entitled as of right to a writ of injunction against any breach of any of the provisions of the contract.

Article 57. Use of Explosives.

When the use of explosives is necessary for the prosecution of the work, the Contractor shall observe the utmost care not to endanger life and property, and whenever directed, the number and size of the charges shall be reduced. All explosives shall be stored in a secure manner and all such storage places shall be marked clearly "DANGEROUS - EXPLOSIVES," and shall be in the care of competent watchmen at all times. The method of storage and handling explosives and highly inflammable materials shall conform with all the State laws and regulations, as well as any local requirements.

Prior to blasting, the Contractor shall serve reasonable notice thereof to the operating official or company, or companies, leasing or owning pipes, conduits, poles, wires, etc., in danger of being injured by the blasting in order that a representative of said owner or lessees may be present at the site, and he shall take proper precaution to prevent such injury by the use of sufficient dunnage.

No blasting shall be attempted until sufficient warning has been given to all persons in the vicinity of the work.

The cost of additional bond or insurance, if any, required by the Owner and/or his agents, or by other duly authorized officials, shall be borne by the Contractor. No extra compensation will be paid the Contractor for the additional risk involved in blasting, for the additional cost of the extreme precautions required for safe blasting or for the additional cost of bonds or insurance required.

Article 58. Traffic Officers and Flagmen.

When in the opinion of the Owner it is necessary that special uni-

formed police be used to direct traffic, he may request the Contractor to obtain, in addition to the usual employees of the Contractor, a reasonable number of special uniformed police, and the Contractor shall obtain and furnish such men. These special uniformed police shall at all times be subject to the direction and control of the Contractor.

To reimburse the Contractor for this additional expense, the Owner will pay to the Contractor, in addition to the contract prices, the cost of such special uniformed police, such cost to include the actual wages paid by the Contractor to such police plus his expenses due to the requirements of the Federal Social Security Act, and the Massachusetts Unemployment Compensation Act and the cost of insurance required under Article 44 to insure said police as herein required.

The Contractor shall pay to any reserve police officer employed by him the prevailing rate of wages paid to regular police officers in such city or town. (C. 149 General Laws, Ter. Ed. as amended by C. 252 of the Acts. of 1939.)

When any work is being done by the Contractor which may obstruct the tracks of a railroad or in any way endanger the running of trains, a flagman or flagmen, designated by the Chief Engineer of the railroad shall be on duty for the protection of the property and traffic of the railroad.

The expense for all flagging service which is required shall be assumed by the Contractor and included in the prices bid for the various items for work to be performed under this contract.

Article 59. Temporary Use of Work.

Any portion of the work which is in an acceptable condition for use may be opened for use as directed and such opening for use shall not be construed as an acceptance of the work, or part thereof, nor shall it act as a waiver of any of the provisions of these specifications and the contract. The Contractor shall make at his own expense any and all necessary repairs or renewals to the work due to said opening for use under instructions from the Engineer, as well as to defective materials and work, natural causes, to ordinary wear and tear or otherwise, preceding completion and acceptance of the work. Completed sections of the work shall be maintained by the Contractor in an acceptable manner, until the final acceptance of the contract. He shall not permit use of any portion of the work unless so authorized by the Engineer.

PROSECUTION AND PROGRESS

Article 60. Subletting or Assignment of Contract.

The Contractor shall give his personal attention constantly to the faithful prosecution of the work, shall keep the same under his personal control, and shall not assign by power of attorney or otherwise, or sublet the work or any part thereof without the previous written consent of the Owner and shall not, either legally or equitably, assign any of the moneys payable under this agreement, or his claim thereto, unless by and with the like consent of the Owner. He shall be responsible for the acts and omissions of his sub-Contractors, if any, and of all persons directly or indirectly employed by him or them in connection with the work.

The Contractor shall comply with the provisions of Section 179A of Chapter 149 of the General Laws, relative to giving such preference to citizens in awarding contracts for public work as is therein provided.

Article 61. Schedule of Operations.

Before commencing work, the Contractor shall, if required, submit a schedule of operations for approval by the Engineer. The schedule shall show the methods and order of operations that the Contractor proposes to use. The approval of the schedule by the Engineer shall not be construed as relieving the Contractor from any responsibility.

Article 62. Prosecution of Work.

The Contractor shall commence work within seven (7) calendar days after the execution of the contract, or within such other period as the Engineer shall authorize in writing, (approved by the Owner) at such points as the Engineer may direct, and he shall thereafter prosecute the work at such points and in such order as the Engineer may from time to time prescribe.

Should the prosecution of the work for any reason be discontinued, the Contractor shall notify the Engineer at least twenty-four (24) hours in advance of resuming operations.

It is the purpose of the Owner to complete the work in the shortest time possible and consistent with approved construction. To this end, Contractors will be required to use improved methods and equipment for doing the work and various parts thereof. All equipment shall be complete and well designed, and the organization shall be efficient and effective.

If, in the opinion of the Engineer, it is necessary at any time, the Contractor shall, when directed, employ such forces and equipment for one or more additional shifts as will be required to insure the proper completion of the work. The Contractor shall provide and maintain, including power or fuel, sufficient lights for the safety of his construction forces and to ensure the proper construction, inspection and prosecution of the work; in addition to any lights necessary to protect the work or the public. The Contractor shall not receive any compensation therefor in addition to the contract unit prices.

The Contractor shall work diligently and steadily on the work, and when ordered in writing by the Engineer to either begin work again or to increase personnel and equipment on the work to speed up progress, the Contractor fails so to do within 5 calendar days, the Contractor shall be considered to have abandoned the job and the Bonding Company shall be notified to complete the work or forces and equipment shall be engaged by the owner to complete the work as per conditions herein.

Article 63. Delay in Commencing Work.

The Owner may delay the commencing of the work, or any part thereof, if the Owner shall deem it best for its interests to do so. The Contractor shall have no claim for damages on account of such delay, but shall be entitled to an equivalent extension of time in which to complete the whole

or any portion of the work required under the Contract. The Contractor shall have no claim for damages on account of any delay on the part of the Owner in performing or furnishing any work or materials to be performed or furnished by the said Owner in connection with the execution of the work covered by the contract.

Article 64. Limitations of Operations.

The Contractor shall so limit his operations and carry on his work in such manner and sequence as to insure the least possible interference with traffic and abutters.

The Owner reserves the right to limit the prosecution of the work to such points and in such order as the Engineer may direct.

Article 65. Character of Workmen.

The Contractor shall employ only competent men to do the work, and whenever the Engineer shall notify the Contractor in writing that any man on the work is, in his opinion, incompetent, unfaithful, disorderly or otherwise unsatisfactory, such man shall be discharged from the work, and shall not again be employed on it except with the consent of the Engineer.

Article 66. Temporary Suspension of Work.

The Engineer shall have the authority to suspend the work wholly or any part thereof, for such periods as he shall deem necessary, because of unsuitable weather conditions, or failure to complete adjacent contracts, or to provide time for moving of utilities, or for such other causes as are considered unfavorable for the satisfactory prosecution of the work, or for such time as he may deem necessary due to the failure of the Contractor to carry out orders given or to perform any provision of the contract. Upon receipt of written order from the Engineer, the Contractor shall immediately suspend work or such part thereof in accordance with the order. No work shall be suspended without the written permission of the Engineer. The work shall be resumed when conditions so warrant or deficiencies have been corrected and the conditions of the contract satisfied as ordered or approved in writing by the Engineer. No allowance of any kind will be made for suspension of work by order of the Engineer, except for an extension of time equal to the period of suspension.

Article 67. Failure to Complete Work on Time.

On or before the date stated in the proposal for completion, the whole work shall have been performed in accordance with the terms of the contract. The time in which the various portions and the whole of the contract are to be performed and the work is to be completed is an essential part of the contract.

In case the work embraced in the contract shall not have been completed by the time stipulated therein (according to the foregoing requirements) the Contractor shall reimburse to the Owner a sum of money equal to the amount that the Owner is required to spend as a result of the delay in completion of the work. This amount shall include the cost of engineering and inspection on the work for the period of time overrun.

The Engineer is to constitute an adjudicator in regard to this Article of the Contract. He is to determine the cost or loss suffered by the Owner as a result of the delay in completion of the work.

Whatever the sum of money may become due and payable to the Owner by the Contractor under this article may be retained out of money belonging to the Contractor in the hands and possession of the Owner; and it is agreed that this article is to be construed and treated both by the parties to the contract and by all courts of law or equity, not as imposing a penalty upon said Contractor for failing fully to complete said work as agreed on or before the time specified in the Proposal, but as liquidated damages to compensate said Owner for all damages actually suffered because of the failure of the Contractor fully to complete said work on or before the date of completion specified in the Proposal.

Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in nowise operate as a waiver on the part of the Owner of any of its rights under the contract.

Article 68. Annulment of Contract.

If the Contractor shall be adjudged a bankrupt, or if he shall make a general assignment for the benefit of his creditors, or if a receiver of his property shall be appointed, or if the work to be done under the contract shall be abandoned, or if the contract or any part thereof shall be sublet without the previous written consent of the Owner, or if the contract or any claim thereunder shall be assigned by the Contractor otherwise than as herein specified, or if at any time the Engineer shall be of the opinion, and shall so certify in writing to the Owner that the work, or any part thereof, is unnecessarily or unreasonably delayed, or that the Contractor has violated any of the provisions of the contract, the Owner may notify the Contractor to discontinue all work, or any part thereof; and thereupon the Contractor shall discontinue such work, or such part thereof as the Owner may designate, and the Owner may thereupon, by contract or otherwise, as it may determine, complete the work, or such part thereof, and charge the entire expense of so completing the work or part thereof to the Contractor; and for such completion the Owner for itself or its agents may take possession of and use or cause to be used in the completion of the work or part thereof of any such materials, animals, machinery, implements and tools of every description as may be found upon the line of said work. The Owner shall not be liable for any depreciation, loss or damage to said materials, animals, machinery, implements or tools during said use, nor until removed by the Contractor after completion of the work. Unless so removed within fifteen (15) days after mailing of notice so to do, they may be sold at public auction, after publication of notice thereof at least twice in any newspaper published in the City or Town, and the proceeds credited to the Contractor's expense subject to a lien for the storage charges.

If the engineer shall certify that the rate of progress is not satisfactory the Owner may, instead of notifying the Contractor to discontinue all work or any part thereof, notify him from time to time to increase the force, equipment and plant, or any of them, employed on the whole or any part of the work, stating the amount of increase required; and unless he shall within five (5) calendar days after any such notice, increase his force, equipment and plant to the extent required therein, and maintain and

employ the same from day to day until completion of the work or such part thereof or until the conditions as to the rate of progress shall, in the opinion of the Engineer, be fulfilled, the Owner may employ and direct the labors of such additional force, equipment and plant as may, in the opinion of the Engineer, be necessary to insure the completion of the work or such part thereof within the time specified, or at the earliest possible date thereafter, and charge the expense thereof to the Contractor. Neither the notice from the Owner to the Contractor to increase his force, equipment or plant; nor the employment of additional force, equipment or plant by the Owner shall be held to prevent a subsequent notice from the Owner to him to discontinue work under the provisions of the preceding portion of this article.

All expenses charged under this article shall be deducted and paid by the Owner out of any moneys then due or to become due the Contractor under the Contract, or any part thereof; and in such accounting the Owner shall not be held to obtain the lowest figures for the work of completing the contract or any part thereof, or for insuring its proper completion, but all sums actually paid therefor shall be charged to the Contractor. In case the expenses so charged are less than the sum which would have been payable under the contract if the same had been completed by the Contractor, the Contractor shall be entitled to receive the difference; and in case such expenses shall exceed the said sum, the Contractor shall pay the amount of the excess to the Owner upon completion of the work, without further demand being made therefor.

MEASUREMENT AND PAYMENT

Article 69. Measurement of Quantities.

The quantities of the various items of work performed shall be determined by the Engineer.

Upon the completion of the work and before final payment is made, the Engineer will make final measurement to determine the quantities of the various items of work performed, as the basis for final settlement. All measurements shall be made according to the United States standard units of measurements.

All materials which are specified for measurement by weight shall be weighed on standard scales furnished by and at the expense of the Contractor. Such scales shall be sealed at the expense of the Contractor as often as is necessary to insure their accuracy. A sworn weigher to be appointed and compensated by the Owner shall weigh all materials required to be weighed as above provided. If materials are shipped by rail or trucks, the car weights or quarry weights may be accepted, but scales shall be used as above, if so directed.

Article 70. Scope of Payments.

The Owner will pay and the Contractor shall receive and accept the compensation as herein provided, in full payment for the furnishing of all materials, labor, tools and equipment and for performing all work contemplated and embraced under the contract, also for all loss or damage arising out of the nature of the work, or from the action of the elements, or from any unforeseen difficulties or obstructions which may arise or be encoun-

tered during the prosecution of the work and until its final acceptance by the Owner, and for all risks of every description connected with the prosecution of the work, also for all expenses incurred by, or in consequence of the suspension or discontinuance or the said prosecution of the work as herein specified, and for any infringement of patent, trade-mark or copyright, and for completing the work in an acceptable manner according to the plans and specifications.

The payment of any current estimate, or of any retained percentage shall in no way constitute an acknowledgement of the acceptance of the work or in no way or degree prejudice or affect the obligation of the Contractor, at his own cost and expense, to repair, correct, renew or replace any defects and imperfections in the construction of, or in the strength of, or quality of materials used in or about the construction of the work under contract and its appurtenances, as well as all damages due or attributable to such defects; which defects, imperfections or damages shall have been discovered on or before the final inspection and acceptance of the work. The Engineer shall be the sole judge of such defects, imperfections, or damages and the Contractor shall be liable to the Owner for failure to correct the same as provided herein.

Article 71. Payment for Increased or Decreased Quantities.

An increase in quantities of work to be performed (as set forth in Articles 3, 22 and 23) will be paid for at the contract unit price for the actual work done, in the same manner as if such work had been included in the original estimated quantities. No allowance will be made for anticipated profits or underruns in quantities.

Changes involving extra work will be paid for according to the method stipulated in the extra work orders.

Article 72. Omitted Items.

The Engineer may order omitted from the work any items or portions of the work found unnecessary to the improvement and such omission shall not operate as a waiver of any condition of the contract nor invalidate any of the provisions thereof, nor shall the Contractor have any claim for anticipated profit.

Article 73. Payment for Extra Work.

Extra work will be paid for in accordance with the accepted and approved extra work orders according to procedures outlined in Articles 22 and 23.

The determination of the Engineer shall be final upon all questions pertaining to the amount and value of extra work performed.

In making any change contemplated, the charge or credit for the change shall be determined by the Owner in one of the following methods prior to the issuance of the order for the changed work:

- (1) The order shall fix the total lump sum cost of the change in the work as mutually agreed on between the Owner and the Contractor and shall set out such cost as the amount to be added to or deducted from the contract amount by virtue of the change in the work. The cost as above shall include the Contractor's overhead and profit except that in any change which involves a net credit to the Owner, no allowance for overhead and profit shall be figured.
- (2) By estimating the number of unit quantities of each part of the work which is changed and then multiplying the estimated number of such unit quantities by the price (which price shall include the Contractor's overhead and profit) for a unit quantity thereof. Unit prices refer to unit prices bid herein. In the event there are no unit prices in the Proposal that are applicable, the Owner and the Contractor may work out a mutually agreeable unit price. The Engineer shall determine whether or not the unit prices in the Proposal are applicable to the extra work under consideration.
- (3) By ordering the Contractor to proceed with the work and to keep and present in such forms as the Owner may direct, a correct account of the cost of the change together with all vouchers therefor. The cost may include a lump sum allowance (fixed fee) for profit and overhead and 10%. The Contractor's labor costs may be increased by the cost of the various health, welfare and liability insurance he is required to carry. The Contractor's total actual cost may be increased by the cost of his Performance Bond.

In figuring changes, the instructions for measurement of quantities set forth in the Special Provisions and Specifications shall be followed insofar as possible. Items such as shovels, picks, small tools, manual equipment, melting pots, etc., shall be considered as part of the Contractor's overhead. Timekeepers, superintendents and office employees shall be considered as a part of the Contractor's overhead.

For machinery, trucks and equipment a standard rental allowance shall be charged. A reasonable rental allowance determined by the Engineer based on published rates and reasonable rental periods shall be used. If a piece of equipment used on extra work for a short period of time (hours or days) is on the job, or has previously been rented, for a long period of time (months) then the long term rental rate shall be used in determining costs.

In the case of any Extra Work ordered by the Owner and completed by a Sub-Contractor on the Project, the General Contractor will be allowed to increase the Sub-Contractor's cost to him by 5% to cover bookkeeping costs, overhead, etc. In determining costs, the Sub-Contractor is to use one of the three methods described herein above.

Article 74. Partial Payments

The Engineer shall, once in each month, make an estimate in writing of the total amount of the work done to the time of such estimate and the value thereof. The Owner shall retain ten per cent (10%) of such estimated value as part security for the fulfillment of this contract by the Contractor, and shall pay monthly to the Contractor while carrying on the work the

balance not retained as aforesaid, after deducting therefrom all previous payments and all sums to be kept or retained under the provision of this contract.

No such estimate or payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the contract, or when in his judgment the total value of the work done since the last estimate amounts to less than three hundred (\$00) dollars.

The Owner may, if it deems it expedient so to do, cause estimates to be made more frequently than once in each month, and it may cause payments to be made more frequently to the Contractor. The Owner may at its option retain, temporarily or permanently, a smaller amount than as aforesaid, and may cause the Contractor to be paid, temporarily or permanently, from time to time such portions of the reserves as it deems prudent.

The Owner may also allow partial payment on such materials and/or items delivered on the site of the work but not considered as erected or complete in place (for which the ordinary payment as specified above would place) but for which, in the judgment and opinion of the Engineer, the Contractor shall be allowed a partial compensation, due to the fact that the scheduled completion of such materials and items has been hindered and delayed by either temporary closing of the project or by such other causes over which the Contractor has no control. The amount of such partial payments will be determined by the Engineer but in no case shall it exceed seventy per cent (70%) of the contract unit price.

The Owner may increase the retained percentage as security for claims or costs incurred under Articles 55, 62, 67 and 68 or any other section of the Contract.

Article 75. Acceptance and Final Payment.

The Engineer shall, as soon as practicable after the satisfactory completion of the contract, make a final estimate of the amount of work done thereunder and the value of such work, and the Owner shall, within sixty-five (65) days from and after the day the work has been approved by the Owner, forward to the Contractor a copy of the final estimate together with an agreement form for his acceptance. After such acceptance has been filed with the Owner payment of the entire sum will be made, so found to be due thereunder after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the contract. All prior estimates and payments shall be subject to correction in the final estimate and payment.

SPECIAL PROVISIONS

HAMPDEN COUNTY

APPROVED

MAR 21 1956

*as to "Special Provisions"
commencing on Page 32 and
ending on Page 51.*

William F. Houghton
Thomas F. Sullivan
Calvin P. Walsh
County Commissioners



TIGHE & BOND
CONSULTING ENGINEERS
HOLYOKE, MASS.

SPECIAL PROVISIONS

Article 76. Scope of the Work. The general outline and details of the proposed work is described on a single page of plans and in a set of specifications entitled:

"PIPER RECREATIONAL DAM
PARKS & RECREATION COMMISSION
TOWN OF WEST SPRINGFIELD, MASS.

Tighe & Bond, Consulting Engineers "
Holyoke, Mass.

The work consists of the construction of all reinforced concrete outlet works and an earth dam across the neck of the valley that was formerly Piper Reservoir prior to the destruction of the downstream dam during the mid-August flood. The dam is approximately 18 feet high and 210 feet long.

Article 77. Proposal Guarantee. The bidder is required to furnish with his proposal a certified check or cash in the amount of Five Hundred Dollars (\$500.00) drawn upon a Bank or Trust Company in the Commonwealth of Massachusetts, and payable to the Town of West Springfield, Mass.

Article 78. Contract Bond. The successful bidder is to furnish to the Owner a Performance and a Labor and Material Payment Bond in the full amount (100%) of the contract for the faithful performance of all work required or labor and material furnished under this Contract.

Article 79. Insurance Requirement. In accordance with Article 44 of the General Requirements, the Contractor is to furnish the following insurance:

Public Liability	-----	\$100,000./\$200,000.
Property Damage	-----	\$25,000./ \$50,000.

The Contractor is warned to read carefully and to have his insurance company read carefully the provisions of Article 44 relating to the required insurance.

Article 80. Special Conditions. The Contractor's attention is called to the following special conditions:

1. The dam is to be substantially completed and ready to store water on Monday morning, June 4.

2. In making the award, the Owner will not only consider the unit prices and total value of the contract, but also reserves the right to consider the proposed construction time as stated in the proposal form. The Owner reserves the right to make an award to a bidder other than the lowest responsible bidder on the basis of proposed construction time. The Contractor's attention is directed to the provisions of the liquidated damages caused in the general requirements and under Article 83. of the specifications.

Article 81. Materials Furnished by the Owner. The Owner will furnish no materials to the Contractor. Also the Contractor is hereby directed and warned that he will not be allowed to use any materials from the bed of the old reservoir in construction of the new dam. All material used in the construction of the new dam is to be obtained from outside the reservoir location. Materials removed under Item 1. are to be disposed of downstream of the location of the proposed recreational dam and will be uniformly spread over the side slopes of the dry reservoir.

Article 82. Engineering Services. The Contractor will be furnished required line and grades for the construction of the conduit and outlet works, including 16" cast iron pipe. These grades will consist of line and grade stakes at 50-foot intervals along the conduit.

On the construction of the dam, the Contractor will be furnished grade stakes for the top of the dam, center line stakes and reference points at each end of the dam, and toe of slope stakes on the ground after completion of excavation. All grade stakes required for construction of the side slopes of the dam and related items will be furnished by the Contractor.

Article 83. Liquidated Damages. The Contractor's attention is directed to the provisions of Article 67. of the General Requirements of this contract. For the purposes of Article 67, completion is defined as a time when impounding of water behind the newly constructed dam is begun by closing off the 16" valve upon mutual agreement by the Contractor and the Engineer. At that time it is assumed that all work on the dam structure itself will be complete, that the intake and conduit will be complete, and that the sand facing for the upstream side of the dam will be complete. Other work required under Items 8, 13 and 14 can be completed after the closing of the 16" valve if the General Contractor so desires.

For the purposes of this contract, the sum of money referred to in Paragraph 2 of Article 67, is hereby defined by the Owner as \$50.00 per calendar day that the job remains substantially uncomplete beyond the time specified in the Contractor's proposal.

ITEM NO. 1.

EXCAVATION

Article 84A. Excavation Defined. Under the heading, Excavation, is included the work of preparing the foundation for the construction of the dam. The existing sandy soil lying on the ground surface is to be removed from under the impervious and semi-pervious sections of the dam and the clay sub-soil is to be exposed for the construction of the dam. Also, all necessary excavation to remove the sand and expose the clay under the intake works and discharge conduit are to be included under this item.

Under the intake works and discharge conduit, the sand fill is to be removed and the clay surface exposed. In the event that the clay surface is below the level of the bottom of the discharge conduit and intake works, the clay is to be raised to the required grade using impervious fill. The discharge conduit and intake works must be built upon clay or impervious fill so as to prevent seepage under the dam along the bottom of the conduit.

Article 84B. Method of Excavation. Excavation may be carried on by the Contractor using either a bulldozer, dragline or clam shell. The only limitation that the engineer will place on the Contractor's excavation methods is that they must not disturb, stir up, turn to jelly, or otherwise affect the clay sub-soil. In general, it is the Contractor's opinion that excavation could probably best be carried out using a dragline to remove the sand and then shaping up the clay sub-soil with as few passes of a bulldozer as possible. However, experience at the time of construction may indicate that a bulldozer cannot be placed on the clay sub-soil at all.

Article 84C. Disposal of Excavated Material. The excavated materials are to be disposed of on the downstream side of the dam. They are to be spread along the side slopes of the empty reservoir using a bulldozer. No further work will be required on them.

Contractor's attention is directed to the fact that the material removed under Item 1, Excavation, is not to be used in the construction of the dam. All material used under Items 2, 3, 4 and 5, in the construction of the dam, is to be obtained from borrow pits outside the reservoir area.

Article 84D. Rock Excavation. No rock excavation is anticipated in this project. For that reason, no item has been set up for such excavation. The removal and disposal of boulders and/or rock excavation is to be considered as earth excavation, Item 1, and is to be paid for as such.

Article 84E. Payment. Payment for excavation shall be made in accordance with the bid price for each cubic yard as shown in Item 1. of the Contractor's proposal. Measurement and determination of quantities will be based on the excavation, in place, prior to the start of work. The Engineer will cross-section the dam location prior to the start of work and again upon the completion of the work under Item 1. The width of excavation will be the width of the upstream third and the middle third of the dam. The unit price per cubic yard quoted under Item 1. by the Contractor shall be full payment and compensation for all work done, in accordance with Article 83A to 83E inclusive, and shall include all labor, equipment and materials required for or incidental to the completion of the excavation work as herein specified or as directed by the Engineer.

ITEMS NO. 2, 3, 4, & 5.

FILL

Article 85A. Work Included. Under these items the Contractor will furnish and place all embankment material required for or incidental to the construction of the dam.

There are four different zones in the dam, each requiring a different material. The central one-third of the dam shall consist of the most impervious material available. The downstream one-third of the dam shall consist of granular, pervious material. The upstream one-third of the dam shall consist of semi-pervious material. The upstream face of the dam shall be covered with a clean, sharp sand or fine washed gravel (grits).

Article 85B. Description of Material. Under Item 2, the Contractor shall furnish and place the impervious central core of the dam. This represents approximately one-third of the total dam cross-section. This material shall consist of selected, impervious soils consisting of a mixture of sand, gravel and clay containing not less than 30% nor more than 60% of material passing a No. 200 mesh sieve. The material shall be of a semi-cohesive nature. The native red hardpan found in most areas of West Springfield is considered ideal material for the central core of the dam providing it is at a reasonably low moisture level when placed.

Under Item 3, the Contractor shall furnish and place semi-pervious material for the upstream one-third of the dam. This material shall be the less select material obtained from the same source as material furnished under Item 2. It shall meet the same requirements for minimum particle size but may contain more sand and gravel.

Under Item 4, the Contractor shall furnish and place the pervious material for the downstream one-third of the dam. This material shall be a granular, non-cohesive, free-draining material comprised mostly of sharp sand and gravel. It shall be essentially free of clay.

Under Item 5, the Contractor shall furnish and place the two-foot thick layer of sand on the upstream face of the dam. This is to act as a protective layer for the dam itself and at the same time prevent the red hardpan from dirtying the water. This material shall consist of a clean sharp sand or fine gravel commonly called "grits". Generally speaking, a suitable material can be found "bank-run" in most gravel pits, providing material is selected that is practically free of stones.

In all cases, the material furnished shall be practically free of organic matter, roots, sod, wood and other deleterious materials. No frozen material will be accepted for placement in the dam. No stones more than 6-inches in maximum dimension are to be incorporated in the embankment and all stones exceeding this are to be disposed of along the downstream toe of the dam.

Article 85C. Description of Construction. Under Item 1, the Contractor is required to excavate all sand and unsuitable material from under the impervious and semi-pervious sections of the dam. The clay sub-soil is to be exposed in this area. Care is to be exercised not to unnecessarily disturb this existing clay sub-soil since a small amount of "working" will cause it to turn to "jelly". It is the Contractor's responsibility to prepare the surface of the clay so as to obtain a good "bond" between the sub-soil and the dam itself and to prevent seepage along this joint.

Material in the main portion of the dam is to be placed so that the top of the dam along its longitudinal axis is maintained practically level. Placement of impervious fill under Item 2 shall be kept slightly ahead of the other material so that the top of the dam shall always have a small, free-draining hump in it.

Material shall be placed in layers of not more than 8 inches measured loose and each and every area shall be compacted by at least two passes of the threads of a heavy (D-8 or equal) dozer. Trucks shall be diverted over the newly placed fill as much as possible but care is to be taken to see that they never follow each other in one set of tracks.

Material shall be placed at the most advantageous moisture level. Material too dry shall be sprinkled as required. Material too wet shall be allowed to dry before being compacted in the fill. In general, only the impervious central core of the dam will need any special moisture control. This material, when being compacted, shall contain sufficient moisture to allow it to be formed into a hard ball or to be molded with firm pressure of the fingers. It shall not contain so much moisture that the compaction process described above will result in excess water being brought to the surface of the soil.

In any areas that cannot be reached and compacted by the dozer, compaction is to be effected using a Barco tamper. All material placed in 8-inch layers is to receive at least one pass with this tamper. If pneumatic tampers are used, material is to be placed in layers not to exceed 4-inches thickness measured loose.

After a period of rain or high humidity, all muddy or loose material is to be pushed off the dam and disposed of in the downstream bed of the reservoir.

At all times care must be exercised to secure good bond between successive vertical layers of material placed and between the various horizontal layers.

Upon completion of the main structure of the dam itself and trimming of the side-slopes, the contractor may proceed with the work under Items 5. and 14.

Article 85D. Wave Control. In order to control wave action and prevent erosion of the upstream face of the dam, the Contractor will be required to place an 8"-thick layer of 2" crushed stone or washed gravel between elevation 146 and 150 on the upstream face of the dam. This stone is to replace an equal volume of sand fill and is to be paid for under Item 5.

Article 85E. Weather Conditions. Weather conditions will control the placement of embankment material to a great extent.

No frozen material is to be incorporated in the embankment. This applies equally to material hauled onto the job in a frozen condition and to material already in the embankment that becomes frozen.

All material incorporated in the embankment is to be at its optimum moisture level and material not meeting this requirement will not be used on the job. Any material already in place that becomes soft, muddy or saturated due to rain or flooding is to be removed from the embankment.

The Contractor's attention is directed to the fact that payment is to be made under the fill items based on measurement of the material in place in the completed work. All material removed due to its frozen or wet condition will be at the Contractor's expense.

Article 85F. Payment. The Contractor will be paid at the applicable unit price specified in his Proposal for each cubic yard of fill, furnished, placed and compacted in the dam. Fill will be measured in place in the completed work by cross-sectioning the dam foundation after completion of work under Item 1. and upon completion of work under Items 2, 3, and 4.

It is understood that the Contractor's unit prices under the fill items include all labor, equipment and materials required to obtain the fill, plan and spread the fill, compact the fill and to do any other incidental work.

ITEM NO. 6.

CONCRETE

Article 86A. Work Included. The Contractor shall furnish and place all concrete required for the completion of the contract. This is to include concrete for the encasement of the discharge conduit, the concrete for the intake works, and all other concrete required for or incidental to the work.

Article 86B. Materials. The concrete used on this job shall show a compressive strength at 28 days of 3,000 lbs. per square inch. The concrete shall contain not more than six gallons of water per bag of cement, including the water content of the aggregate. The concrete shall have a slump range of from 2" to 4". Concrete shall be made up using aggregate not larger than 3/4".

It shall be the Contractor's responsibility to secure or design a mix of suitable proportions and with the required strength and slump.

All concrete used on this job for the headwalls shall be purchased from a transit mix company in the Metropolitan Springfield area, having an experience at this work of at least five years. Concrete mixed on the job with machines will be acceptable for the base of the manhole and the catch basin. No hand mixed concrete is to be used on the job.

Article 86C. Placing of Concrete. Concrete is to be placed in clean forms that have been previously wetted. The concrete shall be thoroughly rodded in order to secure adequate compaction and prevent the formation of rat holes. Aggregate shall be placed in dry weather and no concrete shall be placed under water. Concrete placed in freezing weather shall be made with heated materials and shall be properly protected with admixtures and heated shelters.

Forms are to be securely braced and tied together so as to maintain correct alignment and not bulge when the concrete is placed. The bonds are to be held in place by an acceptable type of form tie which will break off behind the face of the concrete so as to leave no scar in the surface of the concrete.

Article 86D. Protection and Curing. The Contractor shall protect the concrete from damage by rain, snow, frost or underground water during and after placing and until properly cured and hardened. The manner of protection shall be subject to the approval of the Engineer. Concrete shall be kept fully saturated and protected against drying action by an approved method of curing for not less than seven (7) days.

Article 86E. Measurement. Concrete masonry will be measured in place by the cubic yard and the quantities determined in accordance with the dimensions as shown on the plans, and such alterations of the plans as are specifically ordered in writing by the Engineer. In cases where the quality of the work is not as specified or in cases where the dimensions are not as specified, the Engineer may order the removal of the work and its replacement with satisfactory work. If the Engineer deems it expedient and advisable, he may accept such unsatisfactory work, but shall make such an adjustment in the quantity unit price as he shall determine.

Article 86F. Payment. Concrete masonry will be paid for under Item 6. of the specifications. The Contractor's unit price shall include the forms, furnishing and placing of all material, and all labor not otherwise herein provided and that may be necessary to execute the work properly in accordance with the intent of these plans and specifications.

ITEM NO. 7.

REINFORCING STEEL

Article 87A. Work Included. Under this item the Contractor shall furnish in place all reinforcing steel required for the job. In general, reinforcing steel is required in the outlet conduit encasement and in the concrete inlet works.

Article 87B. Type of Steel. Reinforcing Steel shall be new billet stock of intermediate grade manufactured in accordance with the latest A.S.T.M. specifications, allowing high bond design values. Steel furnished shall be suitable for a tensile designed strength of 20,000 lbs. per square inch, with the usual factors of safety.

The bars shall be furnished free of scale, oil and structural defects, when delivered to the job, and shall be stored at the job site in such a way as to maintain them in good condition, free of rust and other deleterious matter.

Article 87C. Placement. Steel shall be placed in the forms in the exact position and with the spacing shown on the drawings or ordered by the Engineer. It shall be so fastened in position as to prevent being displaced during the placing of concrete.

Article 87D. Payment. The Contractor will be paid at the unit price specified in his proposal for each pound of reinforcing steel furnished in place in the completed work. In computing the weight of the bars to be paid for, the theoretical weight and actual length used in the work will be the basis of payment. Wire or metal clips, seats and other supports necessary to hold the steel in place are not to be considered as a part of the reinforcing, and no extra compensation will be given the Contractor for them. The Contractor's unit price under this item is to include all labor, equipment and materials required for or incidental to the item.

All necessary work in the field, in order to fit the reinforcing around various openings and recesses, shall not be considered as extra work and will not be paid for as extra work.

ITEM NO. 8.

STRUCTURAL STEEL

Article 88A. Work Included. Under this item the Contractor shall furnish in place all structural steel required for the job. In general, the only structural steel required is at the top of the inlet works and consists of a grating with supporting angle irons and the guard bars on the side weirs. The work under this item shall include all labor, equipment and materials required for or incidental to the placing of the structural steel.

Article 88B. Material. The materials used under this item are to be as follows:

- (a) Pipe Sleeves. The pipe sleeves are to be 1½" galvanized wrought iron sleeves.
- (b) Weir Guards. The ¾" round guards on the weirs are to be made up of cold rolled steel, threaded one end, and shall be furnished with two nuts on that end.
- (c) Grating Support. The 5 x 3 x 3/8" angle used to support the grating is to be a standard hot rolled structural steel angle iron.
- (d) Grating. The grating used on the top of the inlet works is to be Irving Type AA, with bearing bars having a depth of 2" or approved equal. A suitable device for fastening down the grating to the bearing angle is to be provided. Gratings to be furnished in sections weighing not more than 100 lbs.
- (e) Anchor Bolts. The bearing angles are to be anchored to the concrete with an L-shaped, ¾" anchor bolt, cast into the concrete at each of the four corners of the inlet structure. The supporting angle itself is to be removable by simply loosening up the nuts on the four anchor bolts.

Article 88C. Painting. All structural steel furnished and placed on the job is to be given three coats of paint. One coat is to be shop applied red lead or a combination of red lead and iron oxide. The second coat is to be a gray metal primer. The third coat is to be the finish coat and is to be sage green.

Article 88D. Payment. The Contractor will be paid at the unit price specified in his proposal for each pound of structural steel furnished in place in the completed work in accordance with these specifications. In computing the weight of structural steel furnished, the actual dimensions and the theoretical weight of the steel will be used. The Contractor's unit price under this item is to include all labor, equipment and materials required for or incidental to the item. This is especially to include the installation of the various items of iron work and their painting in accordance with these specifications.

Any necessary work in the field in order to fit the grating or other structural steel work to the various openings and recesses shall not be considered as extra work and shall not be paid for as extra work.

ITEM NO. 9.

CAST IRON

Article 89A. Work Included. Work under this item shall include the furnishing and placing of all cast iron required for the job. In general, the only cast iron required is the manhole steps on the inside of the inlet structure.

Article 89B. Material. Material is to be gray cast iron. The castings are to be sound, true to form and shape, and free from all blow-holes and other defects. The castings shall be sharp and perfect and boldly filleted at all angles and arrises.

Manhole steps shall be cast iron as manufactured by the Flockhart Foundry Company, Type I, or C. M. White #104, or Fleming Foundry Company, Metcalf-Eddy pattern, and weighing approximately 10 lbs. each.

Castings are to be furnished on the job properly sealed and given one shop coat of a bituminous paint.

Article 89C. Payment. Payment shall be made to the Contractor at the unit price specified in his proposal for the number of pounds of cast iron furnished in place in the completed work in accordance with these specifications. The weight used in computing payment under this item is to be the actual weight of the materials furnished. The Contractor's unit price under this item shall include all labor, equipment and material required for or incidental to the work.

ITEMS NO. 10. & 11.

PIPE

Article 90A. Work Included. The work under Item 10. shall include the furnishing and placing of the 60" reinforced concrete discharge conduit. The concrete encasement of this conduit is to be furnished and placed under Item 6.

The work included under Item 11. shall be the furnishing and placing of 16" cast iron pipe and specials.

Under both Item 10. and 11. the work shall include the furnishing and placing of the materials, including jointing and all other labor, equipment and materials required for or incidental to the work.

Article 90B. Pipe Materials. The pipe furnished under Item 10. is to be 60" reinforced concrete, standard strength, culvert pipe, made in accordance with A.S.T.M. specification C-76-52 Table I.

The pipe furnished under Item 11. is to be 16" cast iron pipe having a wall thickness equal to or heavier than Class 100 pipe manufactured in accordance with Federal Specification WWP-421, or approved equal. The special to be furnished under this item is to be a flanged to bell adapter piece, Class D or better, with an American Standard 125 lb. flange. Cast iron pipe and special to be furnished coated inside and outside.

Article 90C. Jointed Material. The 60" reinforced concrete pipe may be laid either with dry joints or with cement mortar or jute in the joint. However, regardless of how the Contractor lays the 60" pipe, some provision must be made to maintain proper alignment of the various pieces of pipe and to prevent the intrusion of mortar into the pipe when the concrete encasement is poured. Therefore, the Contractor is advised to lay this pipe with either jute in the joints or with cement mortar in the joints. Upon completion of the encasement work, the joints on the inside of the pipe are to be filled with mortar so as to present a neat appearance and a smooth flow line.

The bell and spigot joint between the 16" cast iron pipe and the 16" flange to bell adapter is to be made up with lead. The spigot is to be centered in the bell using jute pounded home carefully and leaving at least a 2½" depth of joint for the lead. The lead is to be poured into place in accordance with normal water works practice and upon cooling it is to be caulked.

The flanged joint between the valve and the bell and flange adapter piece is to be made up with bolts and a composition gasket in accordance with standard practice. Upon completion of assembly, the bolts are to be painted with a metallic or bituminous paint.

Article 90D. Pipe Laying. In laying the 60" pipe, the Contractor is to take care to make sure that the bottom of the pipe encasement is poured in contact with either the natural clay sub-soil or with impervious fill placed and compacted to bring the clay sub-soil to the required grade. Care must be taken to see that there is no danger of seepage along the bottom of the encasement. The Contractor may exercise his option as to whether to pour the base of the encasement and place the 60" concrete pipe thereon or whether to place the 60" concrete pipe and pour the entire encasement in one step. However, the former practice will generally produce the desired results in the most economical manner.

The 16" cast iron pipe is to be laid on either undisturbed clay sub-soil or on thoroughly compacted semi-pervious material. In either case, care must be taken to thoroughly compact the material under and around the pipe so as to adequately support it and protect it from damage.

All pipe is to be laid true to line and grade and care shall be taken to secure closeness of joints, true alignment and smoothness and continuity of invert. All joints are to be made up in the dry and under conditions where dirt and water cannot in any way injure the partially completed joint.

Article 90E. Payment. Payment will be made for pipe furnished in place in the completed work at the unit price specified in the Contractor's proposal for the applicable item. Measurement will be made in the field upon completion of work and the contractor will be paid for the actual number of feet of pipe so measured. In the case of the concrete pipe, measurement will be made from the base of the groove in the upstream pipe to the end of the tongue in the downstream pipe. In the case of the cast iron pipe, measurement will be made from the face of the flange in the adapter piece to the base of the bell in the upstream end.

The unit prices in the Contractor's proposal shall be considered to include the complete cost of furnishing and laying the pipe as hereinbefore described, including jointing and all other labor, equipment and materials required for or incidental to the work.

ITEM NO. 12.

DRAWDOWN VALVE

Article 91A. Work Included. Under this item the Contractor is to furnish and install the 16" drawdown valve, complete with extension stem and required stem braces.

Article 91B. Materials. The materials under this item are to be as follows:

(a) Valve.

The valve is to be a 16" flanged, low-pressure, double-disc, bronze mounted gate valve, similar or equal to Chapman List 58½.

The valve is to be fitted with a cold rolled, extension stem, securely fastened to the valve and equipped to be nut operated at its upper end. The operating nut on the extension stem shall be at approximately elevation 146.75.

The invert of the gate is to be approximately 136.00.

The required extension stem guide braces are to be attached to the concrete with cast-in, L-shaped, anchor bolts. Cinch type anchor bolts will not be approved.

Article 91C. Payment. The Contractor will be paid the lump sum specified in his proposal for the 16" drawdown valve and extension stem furnished in place in the completed work, in accordance with these specifications. The Contractor's lump sum under Item 12. is to include all labor, equipment and materials required for or incidental to the work.

ITEM NO. 13.

FENCE GATE

Article 92A. Work Included. Under this item, the Contractor is to cut into the fence on the Amostown Road end of the dam and is to install a double leaf gate having a clear opening of at least 16 feet. The gate shall be the same height and made of the same material as the existing fence. The purpose of this gate is to provide a method of direct access to the construction site, since the Contractor will not be allowed to remove the pine trees on the northerly end of the construction site in the WaterDepartment yard.

Article 92B. Materials. The fence gate installed shall match the existing fence in every respect possible. The fabric on the gate is to be woven wire and galvanized. The gate posts installed are to be adequately sized, securely attached to the existing top rail, and diagonally braced to either a concrete thrust block placed in the ground or to the next lying post back along the fence. The gates themselves shall each be approximately 8 feet wide and shall be capable of swinging a full 180 degrees.

A suitable locking device shall be installed with the gate.

All posts disturbed during the construction and all new line or corner posts installed are to be set in concrete. Also, a concrete block shall be set at the middle of the gate for the locking device.

Article 92C. Payment. The Contractor is to be paid the lump sum specified in his Proposal for the new fence gate, complete in place, including all labor, equipment and materials required for or incidental to the work.

ITEM NO. 14.

LOAMING AND SEEDING

Article 93A. Work Included. Under this item the Contractor is to construct a grassed area across the top portion of the dam and on the downstream face of the dam as directed by the Engineer. In general, it is intended to cover the entire top slope and downstream face of the dam with a protective cover of grass to prevent erosion from rainstorms.

Article 93B. Construction. After the top and side slopes of the dam have been properly graded to the line and grades shown on the plans, the entire area will be covered with approximately 6 inches of loam. Thus the top of the dam shows to be at Grade 150 and this represents the top grade of the structure itself. On top of this will be placed approximately 6 inches of loam which will bring the finished grade of the top of the dam to elevation 150.5.

The loam used on this job is to be a good grade, black, natural soil containing a reaonsable amount of humus. The loam shall not contain excessive amounts of either sand or clay. After spreading and fine-grading the loam, the Contractor will be expected to fertilize and seed it as hereinafter described.

Fertilizer shall consist of a chemical 5-10-5 fertilizer or better, and shall be applied at the rate of 100 lbs. per 3,000 square feet. The fertilizer shall be lightly raked into the surface of the loam and shall be left there for at least one week before any seed is applied.

Seed meeting the hereinafter described analysis shall be applied at the rate of 100 lbs. per 20,000 square feet. Prior to the placing of any seed, the Contractor shall lightly rake the surface of the soil to break up any caked or hardened areas and to level off any eroded areas. The seed used on this job shall be composed of the following mixture:

Orchard Grass	30% or less
Domestic Rye Grass	20% or less
Red or Cured Fescue	20% or more
Blue Grass	20% or more
Other Perennial Grasses	8%
Inert Material, Weeds and Other Matter	2% or less

After spreading the seed, the Contractor shall lightly rake the surface again and shall roll it with a light roller as required. The Contractor may top mulch or otherwise protect the newly seeded areas as required, and at his discretion. The Contractor shall maintain the areas seeded until all work is complete and accepted. Maintenance shall consist of providing protection against traffic and erosion and watering as necessary. Damaged areas and areas of unsatisfactory growth shall be repaired and reseeded as necessary at no additional cost to the Owner.

Article 93C. Payment. The Contractor will be paid at the unit price specified in the Proposal for each square yard of loaming, fertilizing and seeding furnished in place, in accordance with these specifications. The area to be treated will be as specified by the Engineer but will generally cover the top and downstream face of the dam.

FINAL CLEAN-UP

Article 94. General. On completion of the work to be done under this contract, and before final acceptance of the work, the Contractor shall clean up the job so that the condition of the site in every instance will be at least equal to its condition prior to the start of the work.

Dust shall always be controlled by wetting down or by the use of calcium chloride.

The Contractor shall be extremely careful in the conducting of his work to be certain that his work is always neat and clean, compact and workmanlike in operation.

MAINTENANCE OF DAM

CONSTRUCTED

UNDER THIS CONTRACT

Article 95A. General. During the life of this Contract and for one year following the acceptance of the work and the payment of final payment to the Contractor on all of the work, the Contractor shall be responsible for and maintain the dam as constructed under this contract, and shall correct any defects which may appear before final acceptance of the job by the Owner and also during this one year guarantee period. The one year guarantee period shall begin for each and every and all items of the work on the day that the entire project is accepted and final payment prepared for the Contractor on the work.

Article 95B. Basis of Payment. No item is set up for compensating the Contractor for this work, to be done under the requirements of this article, and he is to include the cost of the doing of this work in the various items on his Proposal.

ALTERNATE TO ITEM 10.

60" LOCK JOINT PIPE

Article 96A. Work Included. Under this item the Contractor is to furnish and place 60" reinforced concrete pressure pipe. The purpose of this item is to eliminate the necessity of the concrete encasement on the 60" concrete culvert pipe. If pipe is used under this alternate item, the pipe will be laid without any encasement and with only seepage rings constructed of concrete furnished and placed under the applicable item. If ground conditions warrant, the Engineer reserves the right to order the placement of a reinforced concrete cradle for the lock joint pipe, but at present it is assumed that the use of the cradle will not be necessary.

Article 96B. Materials. Materials to be furnished and placed under this alternate item is to be any type of reinforced concrete cylinder pipe having a rubber and steel, pressure type joint. In general, the lock joint S.P.3, S.P.5 or S.P.12 pipe is acceptable providing it is reinforced sufficiently to withstand a soil of 15 feet of heavy material over the top of the pipe.

Article 96C. Construction. Construction is to be as previously described for Item 10. In the event that a concrete cradle is not used under this alternate item, the pipe is to be carefully laid in a shaped soil so as to be supported on undisturbed material for at least the lowest 90-degree arc of the pipeline. Soil is to be carefully placed around the pipe and hand tamped so as to assure complete support for the pipe and to prevent seepage along the line of pipe.

Seepage rings as shown in the plans are to be constructed at not less than 3 locations as directed by the Engineer. These rings are to be poured against the pipe after the pipe has been placed. The forms are then to be stripped and selected soil is to be placed and compacted against the pipe and the seepage rings.

Article 96D. Payment. The Contractor will be paid for each lineal foot of 60" reinforced concrete pressure pipe furnished and placed in the completed work as herein specified. The pipe will be measured in place from the face of the inlet structure to the downstream end of the pipeline.

Excavation, reinforcing steel, concrete and other materials are to be paid for under the applicable item. The Engineer reserves the right to order the use of a concrete cradle with this alternate pipe item, If he deems ground conditions to be such as to require its use. However, in general, it is anticipated that the only concrete to be placed in connection with this alternate pipe item is the concrete for the seepage or cut-off rings.

MINIMUM WAGE RATES

CONCRETE AND EARTH DAM

Chapt. 461 of
the Acts of 1935PROJECT: Local - Parks & Recreation
Commission

TOWN: West Springfield

RATE PER HOUR

Hoisting Engineer	\$2.85
Assistant Engineer:	
On Steam Machines	2.25
On Other Machines	1.75
Crane Operator	2.85
Power Shovel Operator	2.85
Trenching Machine Operator....	2.85
Tractor Operator	2.40
Bulldozer Operator	2.40
Grader Operator	2.40
Compressor Operator:	
220 cu. ft. or less	1.85
Over 220 cu. ft.	2.30
Jack Hammer Operator	1.75
Roller Operator	2.32½
Concrete Mixer Operator	
1 Bag	1.75
2 Bags or less	2.30
Pumpman	2.30
Other Power Driven Equipment,..	2.32½
Bricklayer	3.12½
Cement Finisher	3.12½
Stone Cutter	2.25
Stone Mason	3.12½

RATE PER HOUR

Mason Tender	\$2.00
Catch Basin & Manhole Builder	3.12½
Carpenter	2.77½
	<u>after 6/1/56</u> ... 2.82½
Pile Driver & Cofferdam Builder	2.75
Iron Worker	3.38
	<u>after 7/1/56</u> ... 3.53
Painter	2.55
Blaster	1.87½
Truck Driver	2.09½
	<u>after 5/1/56</u> ... 2.19½
Euclid Operator	2.35
	<u>after 5/1/56</u> ... 2.45
Pipe Layer	1.75
Stone Spreader	1.75
Asphalt Raker	1.75
Curb Setter	2.50
Common Laborer	1.75
Water Boy75
Electrician	3.05
Granite Cutter	3.08
Operator of 3 axle Equipment	2.15
	<u>after 5/1/56</u> ... 2.25

CONTRACT



**TIGHE & BOND
CONSULTING ENGINEERS
HOLYOKE, MASS.**

C O N T R A C T

Clause 1. This Agreement, made this _____ day of _____ in the year nineteen hundred and fifty _____, between the

_____ herein referred to as the "Owner", and _____

_____ herein referred to as the "Contractor".

Clause 2. Witnesseth, That the parties to this Agreement, each in consideration of the agreements on the part of the other herein contained, do hereby agree, the Owner, for itself, and said Contractor for himself/themselves and his/their heirs, executors, administrators and assigns, as follows:

The Contractor agrees to furnish all equipment, machinery, tools and labor, to furnish and deliver all materials required to be furnished and delivered in and about the improvement and to do and perform all work in: _____

_____ in strict conformity with the provisions herein contained and the Advertisement for Bidders and Proposal hereto annexed, and the General Requirements and Special Provisions hereto annexed, and with the plans referred to therein. All said plans, general requirements, special provisions, addenda,

Advertisement for Bidders, and Proposal are hereby specifically made a part of this contract as fully and to the same effect as if the same had been set forth at length herein.

Clause 3. In consideration of the foregoing premises the Owner agrees to pay and the Contractor agrees to receive as full compensation for everything furnished and done by the Contractor under this contract; including all work required but not shown on the plans for the items herein mentioned, and for all loss or damage arising out of the nature of the work aforesaid, or from the action of the elements, or from any delay or from any unforeseen obstruction or difficulty encountered in the prosecution of the work, and for all risks of every description connected with the work, and for all expenses incurred by or in consequence of the suspension or discontinuance of the work as herein specified, and for well and faithfully completing the work, and the whole thereof, as herein provided, such price or prices as are set out in the accompanying proposal, and for

all work required, for which there is no item in the proposal, such compensation as is provided for in the aforesaid specifications.

IN WITNESS WHEREOF, the Owner has caused this instrument to be signed and its corporate seal to be hereto affixed in its behalf, and the Contractor has caused this instrument to be signed in its behalf.

For the Owner,

Witness:

_____)
_____)
_____)
_____)
_____)

By the _____

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For the Contractor,

Witness:

By the _____

West Springfield Dam Inspections - 1957 - 1968



1957 Reports

Inspections by Tighe & Bond.

Abutters

Springfield Country Club

Abutters

Eastern States Exposition

City/Town

West Springfield

Dam

West Springfield Town Water Dams

Dam

Farnsworth Dam

Dam

Bear Hole Dam

Dam

Bear Hole Water Shed Dam

Dam

Country Club Dam

Dam

Piper Reservoir Dam

Dam

Mittineague Park Dams

Dam

Bear Hole Dam

Dam

Allen Dam

Dam

Fossa Dam

Dam

Lynocsy Dams

Dam

Drobot Dam

Dam

Worthy Paper Company Dam

Dam

Strathmore Paper Company Dam

Streets

Birnie Avenue

Streets	Piper Road
Streets	Morgan Road
Water	Westfield River

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, Inc.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

H-39
Jan. 29, 1957

The Hon. The Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

The undersigned has completed inspections of all dams in the Town of West Springfield. Inspections were carried on from time to time during 1956 and each dam was checked at least once during the year. The following is a report on the condition of the various dams in West Springfield.

A. Worthy Paper Co. Dam

This is an abandoned structure located on Westfield River at a point approximately 4,000 ft. upstream from the bridge connecting West Springfield and Agawam, in the vicinity of the Eastern States Exposition property. This dam has been inactive for many years. The center portion of the dam has been breached and no water has been ponded at this site for some time. When last inspected it was noted that nearly all traces of the dam are gone and for all practical purposes this structure can be stricken from the records of dams in Hampden County.

B. Strathmore Paper Co. Dam

This dam is located upstream of the site of the old Worthy Paper Co. dam approximately 4500 ft. It is a wooden dam having a spillway across the entire width of the Westfield River. The dam diverts water to a canal used for the purpose of supplying process water and power for manufacturing purposes. When this dam was inspected immediately following the flood of August, 1955, there was no major damage apparent at the structure. Water was flowing over the crest of the dam and leakage was not apparently above normal. Shortly following the flood, leakage developed in the dam, apparently as a result of flood debris smashing the planking on the upstream face of the structure and allowing water to pass into and thru the crib section. Reports were subsequently submitted on this dam and repairs were made immediately by the owner. When last inspected, the dam was found to be satisfactory and the canal dike was in good condition.

Jan. 29, 1957

C. Mittineague Park Dams

These dams are two in number and are located in Mittineague Park of the Town of West Springfield. The dams have formed ponds that have been used for swimming and wading purposes. In the recent past the dams have not been used for this purpose because of health problems.

Following the flood of August, 1955, the downstream or lower end of the concrete and stone masonry spillway was found to be undermined at the upper dam. A small washout was noted in natural ground near the dam. The lower dam is also a masonry structure and was topped by the flood water, with a washout downstream of the structure on the right side. Some undermining was noted at the spillway apron. When last inspected, these dams were both found to be in good condition. The upper dam was satisfactory and the toe area has been riprapped. The lower dam is in good condition and the toe area of this structure has likewise been repaired.

D. Fossa Dam

This dam no longer exists. It was located on Piper Reservoir Brook on the northerly side of the so-called White Church Hill and formed a small pond known as Mill Pond. After being destroyed by the flood, a culvert was installed under the road that formed the dam and the brook now passes through the culvert without ponding water.

E. Country Club Dam

This structure is a combination earth and masonry dam located on property of the Springfield Country Club just easterly of Piper Road. During the flood of August, 1955, the dam was washed thru and a wide breach formed to allow for free passage of the water. When last inspected, it was found that the breach had been partly filled with a wide and shallow plug of riprap. Excess water from the small pond passes over the riprap fill. As now existing, the pond formed is less than 10 ft. deep, contains less than one million gallons, and the drainage area above the dam is less than one square mile. Consequently, the dam no longer comes under County jurisdiction. The structure will be inspected annually to be certain that the height of the riprap plug is not increased to result in forming a pond deeper than 10 ft. or more than one million gallons in capacity.

F. Lyncosky Dam

This is a small earth embankment forming a private pond located westerly of Piper Road upstream from the Country Club Dam. In the flood of August, 1955, the dam was topped and washed out. The structure was repaired and a new pipe culvert built. The dam is not an exceptionally good structure, nor is

Jan. 29, 1957

the spillway as large as desirable. However, this dam stores a very small quantity of water and the pond formed is quite shallow. When last inspected, the structure was found to be in satisfactory condition considering the factors involved.

G. Drobot Dam

This dam was formerly located southerly of Morgan Road at a point about opposite the south end of Birnie Avenue. At one time the dam formed a pond for use in connection with a local icehouse. The dam was a shallow fairly long earth embankment that impounded very little water. During recent years the end of the dam has been breached and no pond of consequence was formed. The developments being carried on in the area will result in the abandonment of this structure. When last inspected, no water was stored and the dam, for all practical purposes, was non-existent.

H. Allen (A.L.) Dam

This dam is a small masonry structure located on a tributary to Block Brook just northerly of Dewey St. The pond formed is very small and the water stored is used for private farming purposes. In the flood of August, 1955, the dam was topped but the flood water did no damage to the structure. In recent years when the dam has been inspected, the drainpipe has always been found open and no pond has been formed. When last inspected in 1956, the drainpipe was again found open and no water was in storage.

I. Farnsworth Dam

This is a small dam situated on Block Brook just downstream of Morgan Road. The drainage area involved is just under one square mile. The pond formed is extremely shallow and the dam, consisting of planks, stones and earth, is only 2' above the stream bed. For years this dam has been breached and the small pond now formed provides a wading pool for the local children. The site is checked annually to be certain that no dam is built at this site that would result in the structure coming under the jurisdiction of your Board. At the present time the dam now at the "Farnsworth" site is not a County dam, so-called.

J. Piper Reservoir Dam

This dam was formed by the road fill of Piper Road and prior to the flood of August, 1955, a pond of water existed that was used for recreational purposes. The flood water destroyed this dam and Piper Road has been replaced with a

Jan. 29, 1957

culvert through the fill. A new dam has been built upstream of Piper Road approximately 500 ft. more or less. This dam forms a very small pond for swimming and skating purposes. The dam has been built in accordance with plans and specifications approved by your Board. When last inspected, this dam was found to be in excellent condition.

K. Bear Hole Dam, West Springfield Water Dept.

The dam at Bear Hole formed a reservoir used by the West Springfield Water Department. The flood of August, 1955, washed out this dam completely. The structure is now being rebuilt as a Flood Relief project and the progress of the work is being inspected frequently.

L. West Springfield Water Department Upper Dam, Bear Hole Water Shed


This is an old dilapidated masonry and earth structure situated upstream of the Bear Hole Dam and approximately 1500 ft. downstream from the Holyoke-West Springfield line. The pond formed is not actively used. The structure in general is dilapidated, but its condition is such that it presents no danger to persons and property downstream. The depth of water stored is shallow and the quantity small. When last inspected, the dam was found to be satisfactory considering the factors involved.

In all there are thirteen dams or dam sites in West Springfield, not including some miscellaneous small structures. Of these thirteen, two were damaged by the flood of August, 1955, one of which, the Strathmore Paper Co. Dam, required major repairs.

Four dams were washed out completely. Two of these, the Fossa Dam and the Piper Reservoir Dam carried roadways. These dams have been replaced with road embankments and culverts for passing the stream flow. No water is now ponded at these two sites. A new small dam has been built upstream from the old Piper Reservoir Dam site to provide a small pond for swimming and skating purposes.

Of the other two dams destroyed, the Bear Hole Dam is being rebuilt and the Country Club Dam has been replaced with a smaller structure that does not come under County jurisdiction.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/f

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, Inc.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991
GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

CD West Springfield

Jan. 10, 1958

The Hon. the Board of County Commissioners
Hampden County Court House
Springfield, Mass.

Gentlemen:

The undersigned has completed inspections of all dams situated in the Town of West Springfield. Inspections were carried on from time to time during 1957 and each dam was checked at least once during the year. The following is a report on the condition of the various dams in West Springfield.

A. Worthy Paper Co. Dam

No inspection needed since all traces of the dam have been removed.

B. Strathmore Paper Co. Dam

Conditions at the site of this dam are satisfactory.

C. Mittineague Park Dams

Upper Dam This dam is satisfactory except some riprap has been eroded from the toe of the paved swale. This is not a serious condition.

Lower Dam This dam is in satisfactory condition.

D. Fossa Dam

No inspection was necessary since this dam has now been removed and a road culvert built in its place.

E. Country Club Dam

During the past year, a spillway was built in the breach caused by the flood of August, 1955. This spillway was made of stones, earth, and planking. It is a poor spillway and it does not have satisfactory capacity nor is it properly constructed. The undersigned has met with representatives of the Country Club and they agreed to drain the pond and cease ponding of water until proper action could be taken in connection with repairs to the dam. When last inspected, the pond was found to be drained. It is recommended that before the pond is refilled proper plans and specifications for a spillway be prepared and filed with the County for review and approval. The spillway should then be constructed in accordance with the approved plans. If the pond is to be used in 1958, the spillway construction should be planned immediately and the work built in the coming spring.

F. Lyncosky Dam

The old structure is in fair condition and is satisfactory for the present time.

A new dam has been constructed downstream from the old dam at a site reviewed in the field by the undersigned with Mr. Lyncosky. The dam will be approximately 225 feet long and will have a 36" concrete pipe thru the embankment. A box spillway will be built at the upper end of the concrete pipe. The top of the embankment will be 2-1/2 feet above the spillway. The pond area is apparently going to be approximately 200 feet by 125 feet. Construction on the dam has been stopped until the spring of 1958. The dam as now being built, is less than 10 feet high, will store less than 1,000,000 gallons of water and the drainage area involved is only a fraction of a square mile. Consequently, unless the structure is greatly enlarged it will not come under County jurisdiction.

G. Drobot Dam

This dam has been completely abandoned and no further inspection will be required at this site.

H. Allen Dam

At the time of the last inspection, this dam was breached and no pond was formed. This dam has not held water for some time since the drainpipe is normally found opened when the pond is inspected.

I. Farnsworth Dam

Conditions at this dam are satisfactory. Only approximately 2 feet of water is stored at this structure. As now exists, it is not under County Jurisdiction.

J. Piper Reservoir Dam (New Swimming Pool)

This dam is in satisfactory condition.


K. Bear Hole Dam

This dam has recently been reconstructed and is in good condition.

L. West Springfield Water Dept., Upper Dam, Bear Hole Water Shed

Very little water is stored at this dam. Water from storage overflows to the east of the spillway over natural ground. The structure is somewhat dilapidated but is not dangerous.

Respectfully submitted,


- George H. McDonnell
County Hydraulic Engineer

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

CONSULTING ENGINEERS

CD West Spfld.

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

Dec. 30, 1958

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

The undersigned has completed the inspection of all dams situated within the Town of West Springfield. Inspections were carried on from time to time during 1958 and each dam has been checked at least once during the year. The following is a report on the condition of the various dams in the Town of West Springfield.

A. Strathmore Paper Co. Dam

Conditions at this dam were found to be satisfactory. The alignment of the crest of the dam is good and very little leakage is taking place thru the rock filled timber crib.

B. Mittineague Park Dams

Upper Dam This dam was found to be in satisfactory condition.

Lower Dam This dam was found to be in satisfactory condition.

C. Country Club Dam

This dam is still in the same general unsafe and unsatisfactory condition previously reported. The dam should be either removed from the stream and a free waterway made for the passage of the brook or a proper dam based upon approved plans and specifications should be built and maintained in accordance with the requirements of the law.

Since the drainage area involved is less than one square mile, the owners could build a dam that would be outside of the County jurisdiction if the dam impounded less than 1,000,000 gallons of water and its maximum height would be less than 10 ft. from the bed of the brook at the downstream toe of the dam.

D. Lyncosky Dam

The old dam is in fair condition and its size is such that it does not come under County jurisdiction. It is inspected annually to be certain that the dam itself is not altered to form a deeper and larger pond.

The new dam previously reported has been completed. The pond formed by the dam has an area of approximately 200 ft. x 350 ft. This constitutes a pond area of about 1.6 acres. The pond is very shallow, a portion of the water being stored below the natural ground level. Based upon the average depth of the pond, the quantity of water normally stored at spillway elevation is about 850,000 gallons. The dam itself is much less than 10 ft. in height and the drainage area is but a fraction of a square mile. Consequently, unless this dam is enlarged in the future, it will not come under County jurisdiction. It will be inspected annually to be certain that its size is not changed or the level of the spillway raised to increase storage capacity.

E. Allen Dam

This dam has been abandoned for a number of years and no water has ever been found ponded. The structure does not come under County jurisdiction and has been inactive for a number of years. Because of conditions at the site of this structure and because of its small size, future inspections will not be necessary.

F. Farnsworth Dam

As now existing, the dam does not come under County jurisdiction. Only about 2 ft. of water is stored behind the structure and the pond area is extremely small. The dam is quite dilapidated but since so little water is stored, it presents absolutely no danger to persons and property downstream.

G. Piper Reservoir Dam (New Swimming Pool)

Conditions at this dam were found to be satisfactory.

H. Bear Hole Dam

This dam was found to be in satisfactory condition. The drainage ditch at the right end of the dam should be improved adjacent to the road and the stone paving work should be extended further downstream. This information was passed on to the Water Department.

The downstream drawoff gate in the new spillway is covered by a heavy layer of ice built up by spray passing thru a notch in the spillway. This heavy layer of ice might require breaking by manual effort before the gate could be opened. This is not a serious situation but is more of a nuisance nature. This condition was also passed on to a representative of the Water Department.

I. West Springfield Water Department Upper Dam, Bear Hole Water Shed

This dam is quite dilapidated but is not dangerous. Very little water is stored and in time of extreme flow, the overflow passes over natural ground to the side of the spillway.

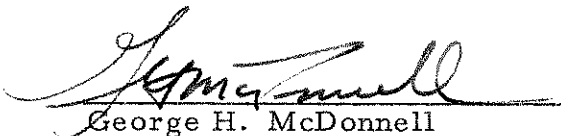
J. Y.M.C.A. Camp Webber Dam

This dam is located upon Paucatuck Brook at a point downstream from the Bear Hole Dam of the West Springfield Water Works. At the location of the dam in question, the drainage area is approximately 6 square miles. Consequently, any dam to be constructed across the brook at this point would come under County jurisdiction and would require plans and specifications of the dam to be filed with and approved by your Board.

The dam now existing at the site is an earth embankment varying from 6 ft. to 8 ft. in height and approximately 70 ft. in length. The top width is about 10 ft. and the side slopes of the embankment are rather steep. An insignificant spillway tube is formed with a concrete pipe placed thru the dam. This tube can provide but a fraction of the needed spillway capacity at this site. The dam is so built that excess flows can either pass around the dam to the west or pass over the structure and do damage to the embankment.

If the dam is to remain and is to be acceptable within the requirements of the law, the structure should be redesigned and rebuilt with proper spillway construction and capacity to provide ample overflow to meet the peak rates of runoff from the drainage area involved.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD West Springfield
Dec. 31, 1959

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

The undersigned has completed the inspection of all dams situated within the Town of West Springfield. Inspections were carried on from time to time throughout the year and each dam has been checked at least once. The following is a report on the condition of the various dams situated in the Town of West Springfield.

A. Strathmore Paper Co. Dam

This dam was found to be in good condition. New planking has been added to the top and crest area of the dam. The alignment of the crest is good.

There is some leakage occurring thru the crib of the dam but, this leakage is not important from a structural safety viewpoint.

B. Mittineague Park Dams - Upper Dam

The grouted stone apron at this dam is being washed out and should be repaired. This condition does not endanger persons and property downstream since the small dam impounds a very insignificant quantity of water. However, repair of the grouted stone apron, at this time, will prevent a more major repair job at some future date.

Lower Dam

This dam was found to be in satisfactory condition.

C. Country Club Dam

This dam has never been completely and properly repaired since the flood of August 1955. A small wooden and earth-

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filled dam was constructed in the breach of the original dam. In the past it has been recommended that the dam installed in the breach be removed to provide a free waterway or a proper dam be constructed.

During the heavy rainstorms of this past Fall, the small wooden and earth fill dam was washed out. As of the end of this year, a free waterway remains thru the breach of the original dam and no water is ponded. The Owner should be notified that no reconstruction of a dam should take place at this location, without first filing plans and specifications as required under Chapter 253 of the General Laws.

D. Lyncosky Dams

Upper Dam This old dam is in fair condition. The dam embankment forms the roadway leading to the lower dam. The embankment has been raised somewhat and improved to provide a better roadway and thus a more stable dam embankment. The structure as it now exists does not come under County jurisdiction. It is inspected annually to be certain that changes are not made which would result in the structure coming under County control.

Lower Dam This dam is in satisfactory condition. The spillway was found to be in a good state of repair and the entrance to the spillway was clear of any debris. The embankment is well shaped and properly maintained. The Owner should keep the embankment at a sufficient height to allow for maximum storm runoff to pass around the dam to the left on natural soil. The left shore of the pond has a low area where the pond could overflow around the dam without water passing over the embankment.

E. Farnsworth Dam

This dam does not come under County jurisdiction as it now exists. It is only about two ft. in height and stores an insignificant quantity of water. The dam is very dilapidated but since so little water is stored, it does not endanger persons and property downstream.

F. Piper Reservoir Dam (New Swimming Pool)

Conditions at this dam were found to be satisfactory.

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G. Bear Hole Dam

This dam and its spillway were found to be in good condition. The drainage ditch at the right end of the dam shows no further sign of erosion which might cause a washout at this point. Surface runoff from the right bank has caused some small erosion in the sand but this is not of a serious nature.

H. West Springfield Water Dept. Upper Dam, Bear Hole Watershed.

This dam is still quite dilapidated but is not dangerous. Only a small quantity of water is stored and in time of extreme flow, the overflow from the pond passes over natural ground to the side of the spillway. Loss of this dam would not endanger persons and property downstream.

I. Y.M.C.A. Camp Webber Dam

This dam has been breached at the brook location and the concrete tube spillway removed. The breach is wide enough to pass the brook flow in time of storm conditions.

A small pond has been constructed downstream. It seems to have been built in part by excavation and in part by constructing a dike to the left of the brook but not entirely across the brook. At the brook location a wide opening exists thru the earth embankment and it is thru this opening that the flow of the brook passes. The structure as existing does not endanger persons and property downstream. It does result in the formation of a small pool that apparently is used for swimming and recreational purposes.

Respectfully submitted


George H. McDonnell
County Hydraulic Engineer

GHM/cmb



GEORGE H. McDONNELL
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TIGHE & BOND CONSULTING ENGINEERS

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD W. Spfld
Jan. 5, 1961

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

The undersigned has inspected the dams situated within the Town of West Springfield and each dam was checked at least once during the year 1960. The following is a report on the condition of the various dams in West Springfield.

A. Strathmore Paper Co. Dam

The dam itself and the abutments were found to be in satisfactory condition. It would be advisable to cut and kill or discourage the growth of brush and small trees from the masonry of the abutment areas and at the face of the canal spillway. Such growth can cause damage to the masonry and can result in the opening of masonry joints. Control of such growth now could prevent expensive maintenance at a later date.

B. Mittineague Park Dams

Upper Dam The grouted stone masonry downstream of the spillway is in need of repair. Conditions are not dangerous to this small structure but repairs made in the near future could prevent the need for more costly maintenance at a later date.

Lower Dam This structure was found to be in satisfactory condition. However, riprap protection on the banks of the stream just below the bridge abutments will be in need of repair in the not too distant future.

C. Country Club Dam

At the time of the last inspection, the new dam at the Country Club was under construction. The Contractor had removed the old temporary dam and was in the process of

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CD W. Spfld
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installing steel sheeting and fill for the new embankment section. Work was progressing satisfactorily and it was expected that the dam would be completed in advance of the Spring of 1961.

As of the end of December, the embankment section had been completed and the new spillway tube and shaft installed. A test of the embankment had been conducted by the Contractor and it was noted that seepage of water from the pond emerged from the toe of the dam near the overflow tube. Apparently the Contractor did not get a tight connection between the tube and the steel sheet cutoff. This section of the embankment is to be excavated and the undersigned will make a field inspection of the joint to determine the seepage cause. As of the writing of this report, the undersigned is awaiting notification from the Contractor that he is ready to excavate to the cutoff wall for the purpose of the field inspection. No water will be stored behind the dam until all work is completed and is of acceptable quality.

D. Lyncosky Dam

The old dam was found to be in satisfactory condition when checked during the year. It is a small structure and since the drainage area is less than one square mile, the dam does not come under County jurisdiction. It is inspected annually, however, to be certain that conditions do not change whereby it will come under County jurisdiction.

The new dam, located downstream of the old structure was found to be in the same general condition as noted when checked in previous years.

E. Farnsworth Dam

This dam was found to be in the same general condition as reported previously. It is small and though dilapidated it is not a dangerous condition. It is only about two feet in height and stores an insignificant quantity of water. The structure as existing does not endanger persons and property downstream.

F. Piper Reservoir Dam (New Swimming Pool)

Conditions at this dam were found to be satisfactory at the time of the last inspection. No water was stored behind the dam and, with the completion of the new artificial swimming pool on the shore of the old pond formed by the dam, it is questionable as to whether or not this dam will be used to store water in the future. The spillway and embankment were satisfactory.

G. Bear Hole Dam

This dam was found to be in satisfactory condition at the time of the last inspection.

H. West Spfld Water Dept. Upper Dam, Bear Hole Watershed

This dam, though quite dilapidated, as reported in previous years, is not dangerous to persons and property downstream. Very little water is stored and in time of extreme flow, the overflow passes over natural ground to the side of the spillway. It is doubtful if this dam will be actively used in the future. However, since its condition does not endanger persons and property downstream, the need for maintenance and repairs is not an important matter.

I. Y.M.C.A. Camp Webber Dam

The original dam at Camp Webber was located upon Paucatuck Brook, at a point downstream from the Bear Hole dam of the Springfield Water Works. At the location of the dam site in question, the drainage area is approximately 6 square miles.


As now existing, the structure at this site is not under County jurisdiction. The main bed of the brook has been moved to the west and a 3-sided dike structure built out from the east bank of the stream. The east and west dimension of the body of water thus formed is small, while the north and south dimension, that is in the direction of the brook, is considerably larger. The inside volume of the pool thus formed by the dike and the natural east bank of the brook is pipe fed from the brook and water is re-

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leased by means of a pipe situated thru the south side dike. Thus, the stream flow of the brook does not go thru the pond as now formed but passes around it. Since the body of water is artificial and is pipe fed, the embankment forming the body of water does not come under County jurisdiction.

Respectfully submitted


George H. McDonnell
County Hydraulic Engineer

GHM/cmb

GEORGE H. McDONNELL
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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD W Spfld
Jan. 5, 1962

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

The inspection of dams within the Town of West Springfield has been completed. Inspections were carried out from time to time throughout the year 1961 and the following is a report on the condition of the various dams located within that community.

A. Strathmore Paper Co. Dam

The dam was found to be in satisfactory condition. Flow of water over the dam prevented any definite checking of leakage thru timber construction. However, alignment of the structure looked good. Attention at right abutment may be needed in a few years. As of the present time, the dam is in satisfactory condition.

B. Mittineague Park Dams

Upper Dam The grouted stone apron downstream of this dam has not been repaired as yet. The condition does not endanger persons and property downstream, since the dam impounds a very small quantity of water. The unraveling of the grouted stone apron has not progressed much, if any at all, from the condition noted last year.

Lower Dam This dam was found to be in satisfactory condition. In a few years there may be need for some maintenance work at the abutment areas. However, for the present time, the dam is in good condition.

C. Country Club Dam

The work on the reconstruction of this dam was completed early in

the year. A number of inspections conducted in January and February indicated corrective work needed at the new construction. This work was done by the Contractor. In the Spring of 1961, it was noted at the downstream face of the embankment, between the old and the new spillway sections that seepage emerged from the toe and that the face of the embankment slope was quite wet and sloppy. The embankment material itself was a fine grain material and not pervious to promote good draining. It was recommended to the Contractor at that time that the material should be compacted, the sloppy material removed and a more pervious material placed. By late Spring the soft, soggy spot on the embankment toe had dried out considerably and seepage was noted to be almost negligible in quantity. Some additional stone was added at the toe of the dam and, throughout the year the structure was inspected from time to time. It was always found to be in suitable condition when checked during the Summer and Fall months.

The dam will be watched closely during the Spring of 1962, in order to determine whether or not the soft embankment condition has been corrected or may be related to ground water from the left side hill.

D. Lyncosky Dams

Upper Dam This old dam is in fair condition, though it is quite dilapidated and receives little attention. The embankment forming the dam carries the roadway across the small stream. As now existing, it is doubtful if the dam comes under County jurisdiction. The pond formed seems less than one million gallons in capacity, the drainage area involved is less than a square mile and the height of the dam is but a few feet. The structure is inspected annually, however, to be certain that it is in reasonably good condition and does not endanger the lower dam.

Lower Dam The embankment of this structure was found to be in satisfactory condition. Though the side slopes are fairly steep, the embankment is stable. The spillway masonry was found to be in satisfactory condition. A screen structure on the spillway could reduce the overflow capacity. However, since the screen material itself is rather weak, any loading of this material as the result of brush and debris collecting thereon, would cause failure of the screening and thus release stored water. The spillway tube was found to be satisfactory. Grades on natural ground to the left of the dam are maintained at such a level that any major flood would pass to the left of the dam before it would pass over the earth embankment. Conditions at the dam are satisfactory.

E. Farnsworth Dam

This dam does not come under County jurisdiction as it now exists. In fact, as of the time of the last inspection, the dam is nothing more than a small pile of stones in the bed of the brook with some miscellaneous debris in the way of timbers at the left end of the original construction. The pond formed by this dam is insignificant in size. The waterway thru the side of the old dam is ample to pass flood flows.

Since this dam has been in this same general condition for many years and there apparently is little chance that it will ever be repaired, future inspections do not seem to be necessary.

F. Piper Reservoir Dam (New Swimming Pool Dam)

Conditions at this structure were found to be satisfactory. The embankment was in good condition, well shaped and there was no indication of sponginess at the toe. Water level in the pond is at the normal low level and overflow is passing thru the hole in the concrete masonry of the spillway shaft. The spillway tube thru the dam was found to be in satisfactory condition.

G. Bear Hole Dam

This dam was found to be in satisfactory condition. Some seepage was noted in the rock fill toe adjacent to the outlet end of the conduit. However, the quantity of seepage noted was not great and no fine material was seen moving with the seepage water. The voids in the rock fill toe seem to be silting up somewhat with sand but this seems more to be local surface wash sand from adjacent areas rather than material carried by seepage water. This condition will be watched and a comparison of the flow made in the coming year.

A small leak was noted in the masonry of the drawoff gate on the wall of the concrete spillway structure. This is a negligible leak and it would be foolish and impractical to try and repair it. The leak does not endanger the structure at all and the quantity of water passing thru is negligible. At some future date, in a dry Summer season, when the water level in the reservoir drops to below the small hole thru the concrete wall, the leak could then be plugged from the upstream side, with lead wool. This matter was discussed with the operator of the dam. He was present during the last inspection.

H. West Spfld Water Dept. Upper Dam, Bear Hole Watershed

This dam is still quite dilapidated but it is not dangerous. When last inspected only a small quantity of water was stored and, in time of extreme flow, the overflow from the pond would pass over natural ground to the side of the spillway. The dam has been inactive for many years and its condition is not dangerous to persons and property downstream.

I. Y. M. C. A. Camp Webber Dam

Conditions at this structure are the same as reported a year ago. The old dam of years gone by has been breached at the brook location and the concrete tube spillway removed. A small pond has been constructed downstream of the old dam site. This pond is to the side of the brook and the valley has been changed to cause the brook to flow around the dike construction that forms one side of the artificial pond. In other words, brook flow does not enter the water impounding structure at all but passes around it. Water is diverted from the brook, with a pipe, into the pond and then the pond level is maintained by water flowing out of the embankment thru a discharge pipe at the opposite end.

The structure as existing does not endanger persons and property downstream and since there is actually no dam across the brook valley, the structure does not come under County jurisdiction.

Respectfully submitted



George H. McDonnell
County Hydraulic Engineer

GHM/cmb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD W. Spfld
Jan. 10, 1963

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

All dams within the Town of West Springfield have been inspected in 1962. Inspections were carried out from time to time throughout the year and the following is a report on the condition of the various dams located within that community.

A. Strathmore Paper Co. Dam

This dam, across Westfield River, was found to be in satisfactory condition. Alignment of the structure was relatively good. Abutment areas were satisfactory. Maintenance at the right abutment may be needed in the near future. As of the present time, the dam is in satisfactory condition.

B. Mittineague Park Dams

Upper Dam This dam was found to be in satisfactory condition. It is in need of certain minor masonry maintenance but the dam impounds such a very small quantity of water, loss of the dam would do no damage to persons and property downstream.

Lower Dam This dam was found in the same general condition as reported in previous years. Some maintenance work is needed in the abutment areas. However, as in the case of the Upper Dam, this dam impounds such a small quantity of water that it presents no danger to persons and property downstream.

C. Country Club Dam

This dam was found to be in good condition when inspected at

three different times during the past year. As reported previously, a soft spot in the new embankment at a point between the old and the new spillway sections was noted shortly after completion of the dam. With passing of time and the addition of pervious material, as well as some broken stone, this soft spot became stabilized. Throughout 1962 the dam was found to be in good condition each time it was inspected.

D. Lyncosky Dams

Upper Dam This small, old and dilapidated dam receives little attention by the Owner. The embankment forming the dam carries the roadway across the small stream for access to the Lower Dam. It is doubtful that the dam comes under County jurisdiction, since the pond formed contains somewhat less than 1,000,000 gallons in capacity. Also, the drainage area involved is less than a square mile. The dam is very low in height and, should it be breached, there seems little chance that it would ever do any damage to persons and property downstream. Though not in good shape and with limited spillway capacity, the undersigned is of the opinion that the dam is satisfactory.

Lower Dam

The embankment at this dam was found to be in good condition. Adequate freeboard was available. The spillway box and tube were found to be OK. Water in storage was at normal elevation when the dam was checked. Conditions were satisfactory and the dam was deemed safe when inspected.

E. Piper Reservoir Dam (New Swimming Pool Dam)

Conditions at this dam were OK when inspected. The embankment is well shaped and reasonably well maintained. The spillway inlet shaft was found to be in good condition and the tube thru the embankment OK. The dam was considered safe when inspected.

F. Bear Hole Dam

This dam was found to be in satisfactory condition. Some seepage was noted again in the rock fill toe adjacent to the outlet end of the conduit. However, the quantity of seepage is not great

and no fine materials were noted moving with the seepage water. The condition will be watched again, as reported a year ago, and a comparison of future flows made with flows noted in the past. The masonry of the spillway structure is in good condition and satisfactorily maintained. The spillway was clean, clear and adequate.


G. West Spfld Water Dept. Upper Dam, Bear Hole Watershed

This small dam is quite dilapidated. It forms only a very small pond. When last inspected, though somewhat dilapidated, the dam was deemed safe and not dangerous to persons and property downstream. It is apparent that this dam is not in active use any more.

H. Y. M. C. A. Camp Webber Dam

As reported in previous years, the dam at this site is not under County jurisdiction, since the pond formed is not in the direct valley of the brook but off to the side and is fed by diverting water from the brook into the artificially formed basin. Since the structure, as existing, does not come under County jurisdiction and does not endanger persons and property downstream, there seems to be no further need for inspection at the site of this dam.

Respectfully submitted


George H. McDonnell
County Hydraulic Engineer

GHM/cmb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD W. Spfld
Dec. 3, 1963

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts

Gentlemen:

All dams situated within the Town of West Springfield have been inspected at least once in the year 1963. The following is the report on the condition of each dam located within that community.

A. Strathmore Paper Co. Dam

The abutment areas at this dam were satisfactory. The right abutment has stones missing from the downstream face but, they are few in number and the condition is no worse than has existed in the past. In general, this abutment is in good condition in spite of the few missing stones. The left abutment was found to be OK and the dike extending therefrom along the canal was satisfactory. At the canal wall, immediately downstream from the abutment, at a point between the dam and the canal spillway, some seepage was noted thru the stones of the wall but the condition is satisfactory.

The timber dam was in good condition and only four or five small leaks were noted along the sill area just above the rock foundation on which the dam is built. The timbers, in general, looked OK. The crest was satisfactory and had good alignment with no evidence of sag. Planking at the crest was in good condition. On the day of the inspection, water level in storage was just below the crest of the dam.

B. Mittineague Park Dams

Upper Dam This small curb dam is in fair shape. The masonry

crest was found to be OK. The downstream grouted stone apron is still unraveling but the edge of the unraveled apron is still at least six to ten feet downstream from the low curb wall dam. The pond formed by this dam stores only about 50,000 gallons of water and the average depth is but one foot. Loss of this dam would do no damage to persons and property downstream. In spite of the poor condition of the downstream apron, the dam was considered safe.

Lower Dam The masonry at this dam was found to be in good condition. Maintenance work has been done at the dam and in the abutment areas. On the day of inspection, the pond was found empty and the drawdown tubes open. The dam was deemed satisfactory.

C. Country Club Dam

The embankment was found to be well shaped. The gravel and stone chip roadway on top of the dam was in good condition. A reasonably good turf is growing on the side slopes of the embankment. The stone fill at the downstream toe, in the vicinity of the spillway, was found to be satisfactory. No toe seepage was noted.

The vertical shaft masonry spillway was in good condition. The tube thru the embankment was OK but it was noted that at the second joint down from the shaft, the rubber ring in the tube joint has been dislodged and is hanging from the joint. A small amount of seepage takes place thru the joint and it is carrying some very fine soil. As yet so little soil has come thru that there is no evidence of settlement at the surface of the embankment directly over the tube. This condition will be watched in the future for the possibility of embankment settlement. The rubber ring gasket is also out of the tube at the upper end of the first length of pipe from the spillway portal. No seepage occurs at this joint.

The old overflow spillway was found to be in good condition. Two stoplogs were in place and water level was at the top of the uppermost stoplog. The dam was considered satisfactory when inspected.

D. Lyncosky Dams

Upper Dam This dam, in the opinion of the undersigned, still does not come under County jurisdiction. Little change has taken place at this structure, although it has received some maintenance during the past year. A small throat has been built in the stream just below the dam consisting of two dikes, one on either side of the stream and

a small raised concrete trough throat between the embankments. This throat is located just upstream from the Lower pond. Spillway capacity at this small dam is limited but, since the structure does not come under County jurisdiction, no directive can be sent in connection therewith. The structure is inspected annually since it is on the roadway to the Lower Dam and, should the dam ever be enlarged to where it would store more than a million gallons, then recommendations regarding spillway capacity would be submitted.

Lower Dam The embankment was found to be in good condition. It was well shaped and covered with a fairly good growth of sod. No brush growth was noted on the slopes. Toe seepage was normal. The spillway inlet was found to be OK and the wood slat and screen rack at the opening to the spillway was clean and clear of any debris. The spillway tube was satisfactory. The dam was considered safe when inspected.

E. Piper Reservoir Dam(New Swimming Pool Dam)

The embankment at this structure was OK. It was well shaped and though no turf grows on the top of the upstream slope, the red gravel surface is fairly stable and erodes little from surface wash. Turf on the dry slope of the embankment is very poor but satisfactory for now. No toe seepage whatsoever was noted. The spillway inlet masonry shaft was in good condition and the tube thru the embankment was satisfactory.

F. Bear Hole Dam

The embankment at this dam was found to be in good condition. It was well shaped. The upstream rock fill face was in good condition. The road on top of the dam was OK and no evidence of settlement was noted anywhere. Though the sod on the downstream face of the dam is only fair to poor, it is satisfactory.

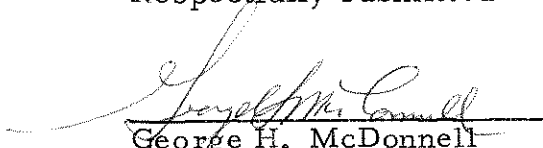
Seepage at the toe appeared to be somewhat less than noted in the past. However, water level in storage was down at least four feet and thus, with the reduced head, it would be expected that seepage would be lower. The concrete conduit thru the embankment was found to be in very good condition. The masonry overflow spillway was also in very good condition. In the opinion of the undersigned, the dam was safe when checked.

G. West Springfield Water Dept. Upper Dam (Bear Hole Watershed)

For years this dam has remained unchanged. It is quite dilapidated and forms only a very small pond. It is no longer active and as existing is not dangerous to persons and property downstream. It would appear as if the Water Department never intends to do anything further with this dam and since it is a municipal structure and there is little chance that it will ever be improved without first obtaining County approval, there seems to be no further need to inspect the structure and carry it on the County records. Since it is inactive and can do no damage downstream, should it wash out during flood flow, it is recommended that it be dropped from the records and the annual inspection routine.

Respectfully submitted

GHM/cmb


George H. McDonnell
County Hydraulic Engineer

January 13, 1964

West Springfield Park & Recreation Dept.
Town Office
126 Park Street
West Springfield, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your two small dams located in Mittineague Park have been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

Lower Dam

"The stone masonry at this small dam on the top surface of the structure just downstream of the crest wall is in need of repair. Some of the surface stones are missing and a void has been formed in the dam. At the toe of the structure in the bed of the stream, particularly on the right half of the dam and at the right stream bank, undermining of the masonry has occurred and this condition should be repaired to protect the structure.

At the time of inspection, the pond was empty and the drawdown gate open."

Upper Dam

"This dam was found to be in satisfactory condition. The water level in storage was at the crest of the small masonry structure and the wall that forms the dam itself was satisfactory. However, the grouted stone toe downstream of the dam itself has become

broken and eroded to a point where, if repairs are not made in the near future, erosion will eventually work its way back to the wall of the dam itself. It would seem advisable to repair the grouted stone toe and improve this apron so that it will not unravel any further."

These two small dams store very little water and present no hazard to persons and property downstream. However, they are inspected periodically and the results of the inspection are submitted herewith for whatever action you care to take. Should either of the two dams fail, very little water would be released downstream. However, each dam does represent a substantial investment and, if it is thought desirable to keep the dams in reasonably good state of repair, then the downstream apron at the toe area of the upper dam should be repaired and the hole on the upper surface of the lower dam together with the undermining at its toe should be investigated and the conditions corrected.

If there is any further information you desire in connection with these two dams, please call or write the undersigned.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

January 13, 1964

Springfield Country Club
1375 Elm Street
West Springfield, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located on your Country Club property was recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The embankment of this dam was found to be in good condition. It was well shaped and was covered with a good growth of turf on the side slopes while the upper surface was stabilized with the stone dust roadway. No seepage was noted at the toe of the dam embankment.

The new spillway inlet was in good condition. However, the tube that extends thru the embankment from the spillway shaft is in need of attention at two locations. The first length of pipe upstream from the discharge end of the tube has settled and the joint between the first pipe and the second pipe has opened up. As of the moment, this condition is not serious but if movement of the lower section of the spillway tube continues, the joint will open up enough to cause a dangerous condition in time of flood flow. The last length of pipe of the tube is partially exposed and in general, is in the stone fill of the toe of the dam. Thus, though the condition could be potentially dangerous, repairs to the joint could be delayed until good weather in 1965. Eventually it is possible that this last length of pipe may have to be removed, its foundation improved, and then the length of pipe reset. For the

time being, the rubber gasket should be removed, any opening in the pipe joint plugged with caulked lead wool and then the entire joint sealed with a cement grout. As mentioned hereinbefore, further movement of the last length of pipe will cause the joint to open and so it must be kept in mind that the repairs as recommended are only temporary.

The second joint in the tube from the spillway shaft has opened up some and the rubber gasket has come out of the joint. An examination of the joint will show dirt oozing thru the joint. If enough dirt comes thru, then a void will be formed in the embankment and settlement of the embankment will occur. Also, if the void becomes large enough, a major leak could occur within the dam embankment. This joint should be repaired as soon as possible by plugging any opening where the dirt and water is oozing thru the joint with the use of driven and caulked lead wool and then the entire joint should be sealed with a cement grout.

The old spillway structure was in satisfactory condition. However, it will be in need of repair in the not too distant future. Two flashboards were on the crest at the time of inspection and water level in storage was at the top of the upper flashboard. Trash was noted in the lower portion of the spillway at the entrance to the old spillway pipe. This trash should be removed. At the upper section of this old original spillway, the left concrete masonry wall needs repairs near the bottom of the wall and at the discharge end of the spillway structure."

It is recommended that the repair work needed at two joints in the new spillway tube be done in 1965. Particular care should be given to the repair of the joint at the second pipe downstream from the vertical shaft inlet. This is the joint thru which soil is oozing and movement of the soil should be stopped.

Any further information you desire in connection with this matter will be made available to you upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

**TIGHE
& BOND**

CONSULTING ENGINEERS

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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD West Springfield
December 31, 1964

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

All dams located within the Town of West Springfield, have now been inspected at least once during the year 1964. The following is a report on the condition of each dam located within that community.

A. Strathmore Paper Co. Dam

The right abutment masonry structure was found to be in satisfactory condition. Some of the stone work is missing from the downstream face near the bottom of the structure but this condition is not dangerous to the safety of the abutment. This structure is massive.

The timber dam appeared to be satisfactory. It could not be inspected closely because of the amount of water spilling over the crest of the dam. However, the timbers that were visible were good and there was no unusual leakage thru the timbers.

The grade of the crest was fairly good. A sheet of water flowed over the entire length of the crest except for a short distance at each end of the dam adjacent to the abutment structures. Alignment of the crest appears to be a bit wavy.

At the left abutment, the gate house has been removed and has been replaced with an out-of-doors type of gate operator. It is an A-frame arrangement from which a chainfall is used to raise and lower the gates. The same operating mechanism is used for each gate and moves across

the track that is supported by the A-frame. The gate openings on the surface of the abutment masonry are protected with steel plate hatches properly hinged and fastened.

The canal dike was found to be satisfactory. The spillway in the canal wall was good and the masonry of the structure was well maintained. The canal drawdown facility was satisfactory but there is some erosion of the concrete piers and walls that separate the gate opening. The operating mechanism for the gates in this structure is similar to the mechanism for the main gate at the canal headworks.

In the opinion of the undersigned, the dam was safe when inspected.

B. Mittineague Park Dams

Upper Dam This dam was found to be in satisfactory condition. The water level in storage was at the crest of the small masonry structure and the wall that forms the dam itself was satisfactory. However, the grouted stone toe downstream of the dam itself has become broken and eroded to a point where, if repairs are not made in the near future, erosion will eventually work its way back to the wall of the dam itself. It would seem advisable to repair the grouted stone toe and improve this apron so that it will not unravel any further.

Lower Dam The stone masonry at this small dam on the top surface of the structure just downstream of the crest wall is in need of repair. Some of the surface stones are missing and a void has been formed in the dam. At the toe of the structure in the bed of the stream, particularly on the right half of the dam and at the right stream bank, undermining of the masonry has occurred and this condition should be repaired to protect the structure.

At the time of inspection, the pond was empty and the drawdown gate open.

C. Country Club Dam

The embankment of this dam was found to be in good condition. It was well shaped and was covered with a good growth of turf on the side slopes while the upper surface was stabilized with the stone dust roadway. No seepage was noted at the toe of the dam embankment.

The new spillway inlet was in good condition. However, the tube that extends thru the embankment from the spillway shaft is in need of attention at two locations. The first length of pipe upstream from the

discharge end of the tube has settled and the joint between the first pipe and the second pipe has opened up. As of the moment, this condition is not serious but if movement of the lower section of the spillway tube continues, the joint will open up enough to cause a dangerous condition in time of flood flow. The last length of pipe of the tube is partially exposed and in general, is in the stone fill of the toe of the dam. Thus, though the condition could be potentially dangerous, repairs to the joint could be delayed until good weather in 1965. Eventually it is possible that this last length of pipe may have to be removed, its foundation improved, and then the length of pipe reset. For the time being, the rubber gasket should be removed, any opening in the pipe joint plugged with caulked lead wool and then the entire joint sealed with a cement grout. As mentioned hereinbefore, further movement of the last length of pipe will cause the joint to open and so it must be kept in mind that the repairs as recommended are only temporary.

The second joint in the tube from the spillway shaft has opened up some and the rubber gasket has come out of the joint. An examination of the joint will show dirt oozing thru the joint. If enough dirt comes thru, then a void will be formed in the embankment and settlement of the embankment will occur. Also, if the void becomes large enough, a major leak could occur within the dam embankment. This joint should be repaired as soon as possible by plugging any opening where the dirt and water is oozing thru the joint with the use of driven and caulked lead wool and then the entire joint should be sealed with a cement grout.

The old spillway structure was in satisfactory condition. However, it will be in need of repair in the not too distant future. Two flashboards were on the crest at the time of inspection and water level in storage was at the top of the upper flashboard. Trash was noted in the lower portion of the spillway at the entrance to the old spillway pipe. This trash should be removed. At the upper section of this old original spillway, the left concrete masonry wall needs repairs near the bottom of the wall and at the discharge end of the spillway structure.

D. Lyncosky Dams

Upper Dam This dam is in the same general condition as reported previously. In the opinion of the undersigned it still does not come under County jurisdiction but since it is adjacent to the dam that is inspected annually, comments are made on the upper dam in each annual report. The embankment that forms the dam is fairly wide for its low height and the top of the embankment is paved with an asphalt roadway. The spillway tube thru the embankment is a small pipe that has become partially

plugged with debris. Even if the rate of flow from the small pond exceeds the capacity of the spillway tube, water could overflow the entire embankment without endangering the structure.

Lower Dam The embankment of this dam was found to be in good condition. It is well shaped and is covered with a good growth of turf. Toe seepage was normal. The inlet to the spillway was in good condition and the wooden rack was clean and clear of any debris. Water level in storage was at the crest of the concrete overflow structure. The tube thru the embankment was okay and was clean. The outlet end of the tube was satisfactory. It was noted that the dam has been well maintained during the past year.

E. Piper Reservoir Dam (New Swimming Pool Dam)

The embankment of this dam was found to be satisfactory. It is fairly well shaped and though it has little or no turf cover, the material from which it is made is a combination hardpan and gravel and the surface of the embankment is resistant to gulleying and erosion.

The spillway inlet shaft was found to be okay. Water level in storage is controlled by a hole that has been cut thru the upstream face of the concrete masonry shaft at an elevation of about 3 ft. below the crest of the shaft original spillway. This hole has no gate control and provides for gravity flow from the pond into the spillway shaft and thence thru the embankment in the conduit. The hole that has been punched thru the concrete wall of the shaft results in a lower level being maintained in the pond and thus increases the safety of the dam.

The tube from the spillway shaft thru the dam embankment was clean and clear of debris and functioning satisfactorily.

F. Bear Hole Dam


The embankment of this dam was found to be in satisfactory condition. The road on top was satisfactory. Riprap fill on the upstream face of the embankment was good. Turf on the downstream face is rather poor. The entire toe of the structure at the central section of the dam consists of riprap fill and this fill was satisfactory.

The large concrete spillway structure was in good condition. Water level in storage was about 5 ft. down below the crest of the spillway. At the

toe of the dam and at the outlet end of the large spillway conduit, seepage emerges from the rock fill of the structure. It was noted that some seepage appears to be coming up from under the floor of the conduit as well as from both sides, but particularly from the left side of the conduit. The seepage seems to be a little larger in quantity than noted before. However, there are no fine soil particles moving with the water. It is clean and clear. This condition will be watched again in 1965 and proper corrective action will be recommended if the quantity of seepage increases or if any evidence is found of soil particles moving with the water.

In the opinion of the undersigned, the dam was safe when inspected.

Respectfully submitted,

A handwritten signature in cursive script, reading "George H. McDonnell", written over a horizontal line.

George H. McDonnell
County Hydraulic Engineer

GHM/mg

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD West Springfield
December 14, 1966

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

All dams situated within the Town of West Springfield have now been inspected at least once during the year 1966. The following is a report on conditions noted at each of the dams located within West Springfield.

A. Strathmore Paper Co. Dam

This dam was repaired during the past Summer. A special letter-report was submitted to your Honorable Board on July 29, 1966, regarding conditions at the dam and leakage through the old timber structure near the left abutment.

The undersigned made numerous inspections of the dam during progress of the repair work and two inspections have been made since the completion of the repair work. The most recent inspection was made on Monday, December 12, 1966.

Very little toe leakage was noted along the length of the dam. Water overflowed the entire crest but the sheet of water was relatively thin and it was possible to observe the timber crib itself through the sheet of overflowing water. Nowhere did the undersigned note any major discharge of water through the timber crib work. The alignment and grade of the crest was relatively good. The new concrete plug formed by filling the entire dam with mass concrete just to the right of the left abutment is functioning in an excellent manner. This massive concrete has weighted the dam as well as sealed the leakage that was occurring through this portion of the dam.

Both abutments were noted to be satisfactory. At the left abutment the canal headworks were in good condition. The canal overflow spillway has been improved through the pouring of a new concrete slab and a new concrete crest wall. The earth-filled dike itself running the length of the canal from the dam to the mill was in satisfactory condition.

At the right abutment, some minor erosion of masonry was noted but the abutment was considered to be satisfactory.

In the opinion of the undersigned, this dam is in good condition.

B. Mittineague Park Dams

Upper Dam The lower end of the apron just downstream of this small dam is still broken and partly undermined. The condition as existing does not endanger the dam. The undermining and breaking of the end of the apron has been noted for many years. The masonry of the small wall which forms the dam is in fair condition. No flashboards were on the crest of the dam. Very little water is ponded by this structure since the pond volume has been filled almost to the elevation of the spillway with silt and sand washed down from upstream.

Though this dam is in need of minor maintenance and masonry repair, in the opinion of the undersigned it is safe. From time to time in the past, the Park Department has been notified of the conditions existing at this dam and there seems to be no need to advise the Park Department again.

Lower Dam This dam is in about the same condition as noted in recent years. The masonry is in fair condition but does need some maintenance. On the day of inspection, no water was in storage. Some undermining of the downstream end of the dam apron was noted. No flashboards were on the crest. This undermining has been reported in writing to the Park Department of West Springfield.

At the time of the inspection, it was the opinion of the undersigned that though this dam is in need of maintenance and repair, it is safe.

C. Country Club Dam

The embankment forming this dam was noted to be in satisfactory condition. It is well shaped and was covered with a good growth of turf on both side slopes. The upper surface of the embankment was stabilized with a well packed stone dust roadway. An examination of the toe of the dam indicated no seepage of any amount is occurring through the embankment.

The new spillway inlet structure was noted to be in good condition. However, the tube passing through the embankment from the spillway shaft to the downstream toe of the dam is in need of repairs as noted in the report last submitted. The first length of conduit pipe upstream from the discharge end of the tube has moved and settled even more than last reported and the joint between the end pipe and the second pipe has opened up sufficiently where now it is possible to reach through the joint and dig out embankment material. This embankment material is being held in place by arch action over the opening. However, in time, this arch action will fail and with further movement of the last pipe, embankment material will drop into the opening at the conduit joint and a failure will occur in the toe of the dam.

It is recommended that the Owner be directed to remove and reset this last length of conduit pipe during the coming year.

The second joint in the new spillway tube situated downstream from the spillway shaft itself has also opened up as reported previously and the rubber gasket has come out of the joint. An examination of the joint on December 12 showed dirt is still oozing from the joint and that the Owners have not taken any steps to correct this condition as recommended in the letter from your Board sent in January of last year. This second joint should be repaired and it is possible that the repair work can be accomplished without digging out this pipe and breaching the entire embankment.

The old spillway facility will be in need of masonry repairs in the not too distant future. However, for the present, it is satisfactory. The usual flashboards were on the crest and water level was passing over the top of the upper flashboard.

It is recommended that the Owner be sent a copy of this report and be directed to make repairs to the flood flow conduit during the coming year. Since failure to make the repairs could cause loss of the dam, it is further recommended that the Owner be required to complete the repairs by June of 1967 or, at that time, your Board should direct that the pond be drained and kept drained until all repairs have been completed.

D. Lyncosky Dams

Upper Dam This dam is in the same general condition as reported previously. In the opinion of the undersigned, it still does not come under County jurisdiction but since this structure is adjacent to the dam that is inspected regularly, comments are made on the Upper Dam with each report on West Springfield inspections.

The embankment that forms this small dam is fairly wide for its low height and in recent months, the width of the embankment has been further increased by the dumping of fill downstream of the embankment. The spillway tube through the embankment is still a small pipe that is partially plugged.

Lower Dam The embankment of this dam was found to be in relatively good condition. A good growth of turf exists on both slopes and on the top of the embankment. No brush cover whatsoever was noted. Toe seepage does occur but the amount of seepage noted was normal for this small dam.

On the day of inspection, water level was at the crest of the masonry spillway inlet. The wooden and screen inlet rack was noted to be in satisfactory condition.

The spillway tube discharge apron is becoming undermined and this masonry apron should be repaired in the coming year.

E. Piper Reservoir Dam (New Swimming Pool Dam)

This dam is in the same general condition as reported previously. The downstream face of the embankment has a fair growth of turf while the upstream face has very little turf growth. The surface of the embankment on the wet side is a combination of hardpan and packed gravel. There is no evidence of gullying as a result of surface wash on this embankment.

The spillway inlet shaft was okay. Water level in storage is controlled by a hole cut through the upstream face of the concrete masonry shaft. Outside of this hole there is a small flashboard over which water flows to pass into the spillway shaft via the cut hole. This hole and the related flashboard result in a lower water level being maintained in the pond than originally planned. This increases the safety of the dam.

Immediately downstream of the dam some improvements have been made by filling of the stream bed and laying of a small pipeline down to the culvert under Piper Road. This construction is not in relation to the dam and the presence of the fill and the small pipeline do not affect the safety of the dam in any way whatsoever.

An inspection of the tube through the embankment showed it to be in very good condition and to be in good alignment.

In the opinion of the undersigned, this dam was safe when inspected.

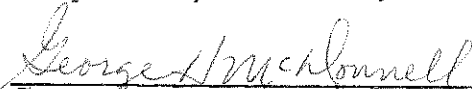
F. Bear Hole Dam

The embankment at this dam was found to be in satisfactory condition. The road on top of the dam was in good shape and there was no evidence of any cracking or settlement. The riprap fill on the upstream face of the embankment was in good condition. Turf on the downstream face was noted to be rather poor. The rock filled toe of the embankment was satisfactory. A close examination of the rock fill adjacent to the large conduit through the embankment shows seepage to be about normal. Seepage has always occurred through this rock fill and at each inspection the seepage is observed to determine whether or not it is increasing or decreasing. In the opinion of the undersigned, no change has occurred. Seepage is about normal and no fine grained material is moving with the trickling water as it passes through the voids of the riprap fill and discharges into the stream below the discharge end of the large conduit.

The large concrete spillway structure was noted to be in good condition. Water level in storage was at the crest of the spillway wall. No flashboards were on the crest.

In the opinion of the undersigned, the dam was safe when inspected.

Respectfully submitted,



George H. McDonnell
County Hydraulic Engineer

GHM/app

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD West Springfield
July 10, 1968

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

All dams situated within the Town of West Springfield have now been inspected at least once during the year 1968. The following is a report on conditions noted at each of the dams located within the Town of West Springfield.

A. Strathmore Paper Co. Dam

On the day of inspection, July 3, 1968, a fairly large quantity of water was flowing in the river and passing over the crest of this dam. Consequently, a thorough examination could not be made, particularly, insofar as the face of the dam and the toe of the structure are concerned. It is expected that another inspection will be made later in the summer following a period of dry weather when river flow will be low and the face of the dam, as well as the toe, can be observed.

Both abutment areas were good. The canal headworks and the canal overflow spillway were o.k. The ledge of the right abutment, as well as the stone masonry abutment wall were found to be o.k. Some minor erosion was noted but it is of no importance.

The timber dam seemed to be o.k. However, at various locations in the vicinity of the middle third of the dam, there appeared to be

considerable turbulence at the toe which might be caused by leakage of water through or under the base of the dam. Since a large volume of water was overflowing the crest and causing considerable disturbance in the pool below the dam, it was not possible to tell if the extra heavy disturbance and boiling in the river at the central third of the dam was related to the overflow or possibly some undesirable underflow. It is this condition that will be observed later on when run-off decreases and river flow becomes low.

The crest of the dam appeared to be o.k. There was some slight variation noted in alignment and there appeared to be a slight sag in the crest but it did not appear to be of any major proportion. The sag will be noted at future inspections.

Based upon the information that could be gathered in the field at the time of the inspection, conditions at the dam appeared to be o.k.

The repairs completed a couple of years ago at the left end when mass concrete was poured in among the timbers, are standing up well.

B. Mittineague Park Dams

Upper Dam - This small dam is in fair shape. The downstream concreted stone apron is breaking up and becoming undermined but the condition is not much worse than that reported at the time of the last inspection. The grouted stone wall and the concrete cap forming the dam proper were o.k. Water level in storage was just above the crest of the notch thru the dam. Hardly any water is stored by this small structure because the pond volume is almost completely filled with sand and gravel washed down from upstream by storm flows. No flashboards were on the crest of this dam. This dam is so low in height, only about 4 feet above the toe at the deepest point, and it stores such a small quantity of water that loss of the structure would do no damage to persons and property downstream. It is the type of dam that would go out slowly if it ever did deteriorate. The only reason that this dam is inspected is that it is a public structure and because of the drainage area involved.

Lower Dam - This dam is in the same general condition as noted and reported in recent years. The drawdown pipe is open and no water is ponded. The dam itself is in fair condition. The concrete curb wall which has replaced the old stoplogs is o.k. No stoplogs are in use at this dam.

On the whole, the masonry needs touching up and minor repairs at various locations. However, as in the case of the Upper Dam, this structure is so small that even if it failed when storing water, it would do no damage to persons and property downstream.

C. Country Club Dam

The embankment forming this dam was found to be in satisfactory condition. The cart road across the top was good and showed no signs of any depression or settlement. Side slopes of the dam embankment have a good grass growth cover.

The tube through the embankment from the flood flow spillway has been repaired. The joint between the first and second pipe from the portal has been sealed with cement grout. The work has been accomplished in what appears to be a satisfactory manner. There is no crack or opening at the joint and there is no further evidence of any additional pipe movement. This joint should be inspected from time to time by the owner and any opening of the joint or any crack formation should be repaired as soon as noted. A special letter-report has already been submitted to your Honorable Board in connection with this matter and a copy has no doubt been forwarded to the Country Club.

The joints of the tube up in through the embankment have all been maintained and were found to be in satisfactory condition. Some of the joints near the upper end of the tube are seeping at the top but this is expected. Little or no fine material is moving with the seepage water. The large opening noted previously has been repaired.

The riprap fill at the toe of the dam in the vicinity of the spillway tube was noted to be o.k. On the day of inspection, July 3, 1968, water level in storage was below the crest of the flood flow spillway and at the crest of the old original spillway.

The flood flow concrete spillway shaft was o.k. There is one small leak thru the face of the wall at the southwesterly corner but this leak is small and is of no consequence.

The old original spillway is in fair condition. It was operating at the time of the inspection with normal flashboards on the crest. Water level was overflowing the crest. Though the masonry of this structure could stand some repair and maintenance, the spillway is fairly good and, in the opinion of the undersigned, is satisfactory.

This dam is considered to be safe now that the repairs have been made to the spillway tube.

D. Lyncosky Dams

Upper Dam - This small dam is in the same general condition as previously reported. In my opinion it does not come under County jurisdiction, but since the structure is adjacent to the Lower Dam which is inspected regularly, a report is submitted on the general condition of the Upper Dam.

The embankment forming this dam is quite wide for its low height. The top of the embankment carries a paved road and this roadway has been hardened and improved in recent years. Even if flood flows should exceed the capacity of the small spillway tube thru the embankment, surplus flow could pass over the embankment on the roadway without doing any substantial damage to the structure.

Lower Dam - The embankment at this dam is in fair condition. The top has a good growth of turf. Side slopes are weed-covered but the condition is not bad. The inlet to the spillway tube was o.k. The usual wooden rack, together with side screens protected the crest and the spillway tube from debris. The wooden rack was clear of any debris. Water level in storage was just above the crest of the spillway inlet. The spillway tube thru the embankment was o.k. At the discharge end of the tube the apron is undermined as reported in the previous inspection report. However, the condition has not become any worse so that it is not necessary to take further action at this time relative to requiring repairs to the apron.

Some seepage was noted at the toe near the centerline of the dam but this is normal and no fine-grained material was noted moving with the water.

Though this dam receives little maintenance, in the opinion of the undersigned, it is in fair condition and o.k.

E. Piper Reservoir Dam (New Swimming Pool Dam)

The earth embankment forming this dam was found to be satisfactory. The upstream surface was in fair condition and is composed of hard-pan and gravel. No erosion was noted on the surface. The top of the dam consists of about the same material. The downstream surface of the dam has a fair to good sod cover.

The vertical shaft inlet to the spillway is in the same condition as reported at the time of the last inspection. Water level in storage is at the crest at the hole cut in the spillway below the designed crest of the structure. The hole thru the spillway is protected from debris with a flashboard arrangement to allow water to pass under the flashboards and into the hole without carrying trash and floating debris.

The spillway tube thru the dam embankment was in good condition. The discharge end of the tube and the brook bed were o.k.

The toe of the embankment was wet to the left of the spillway tube. However, there was no movement to the water. To the right of the spillway tube the toe of the dam is dry.

This dam formerly ponded water for swimming use. However, the town built an artificial swimming pool on the left bank of the stream just above the dam and all swimming is now done in this concrete standard-type municipal pool.

F. Bear Hole Dam

The embankment forming this dam was found to be in good condition. The riprap surfaced water face was satisfactory. The asphalt paved road across the top of the dam was o.k. The dry slope on the downstream side has a very poor turf cover. The cover, what there is of it, is mostly weeds. However, there is no sign of erosion on the surface.

Seepage was noted at the rock toe to the left of the conduit as well as to the right of the conduit just above and at the toe of the dam. Seepage at the left appeared to be about normal. However, seepage to the right of the conduit and observed at a point about 5 feet back from the end of the conduit seems to have increased and small pools of water within the rock toe have deposits of fine sand. This sand could have washed out from the gravel on which the riprap is laid or from the embankment material itself.

There is another possible explanation to this apparent increased seepage and this is that the water could be either surface runoff from the westerly gutter of the roadway leading to the dam or it could be seepage water from the high sandy hill located just to the west of the dam. The month of June, particularly the last portion of the month, has been extremely wet. The inspection of the dam was made on Wednesday, July 3rd. On the previous Friday, a very heavy rainstorm occurred and continued for some time. This rainstorm could have washed sand from the road gutter into the riprap and it could also have saturated the hill whereby seepage is still occurring from this area.

In any event, the seepage as noted on July 3rd is not as yet of any serious proportion. However, it should be observed again early this summer. The undersigned expects that following a period of dry weather, another inspection of this seepage will be made to see whether or not it is decreasing in quantity. If the seepage is related to water from the side hill or the roadway gutter, it can be expected that a reduction in flow will be noted following a dry period.

The concrete spillway structure was found to be in satisfactory condition. Water level was overflowing the easterly spillway about one inch in depth. No cracks or problems were noted with this large concrete structure. Surface of the concrete is o. k. and no erosion of any importance was noted anywhere. No flashboards were on the spillway crest.


In the opinion of the undersigned, the dam is safe but the seepage condition will require at least one additional inspection later on this summer and as soon as possible following an extended dry weather period.

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The undersigned discussed the conditions at the dam and particularly this seepage, with the operator of the facility which is owned by the West Springfield Water Department.

Respectfully submitted,



George H. McDonnell
County Hydraulic Engineer

GHM/amd

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD West Springfield
August 27, 1968

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

This is a supplementary report to the report of July 10, 1968 on the condition of dams in the Town of West Springfield. When my report of July 10, 1968 was submitted, it was pointed out in connection with the Strathmore Paper Co. Dam, that because of high river flow, a re-inspection would be made at a later date to observe any possible leakage at the base of the dam when river flow would not be passing over the dam and thus not obscuring the face of the structure from view.

In connection with my report on the Bear Hole Dam of the West Springfield Water Dept., an increase in seepage was noted and comments were made as to the possible cause for this increased seepage. I pointed out that an observation would be made again during the summer, following a period of dry weather, to observe seepage conditions at that time.

Re-inspections of the Strathmore Paper Co. Dam and the Bear Hole Dam were made on Thursday, August 22, 1968. Conditions noted at these two dams were as follows:

Strathmore Paper Company Dam

On re-examination of this dam, the entire face of the timber crib structure was visible. A small quantity of water was overflowing the crest of the dam at various locations. The locations of overflow were at points where the crest sags slightly or is worn.

The depth of flow at these various sags did not exceed an inch or two.

Some seepage and leakage was noted thru the base of the dam at various points along the entire length of the dam. Some minor leakage even appeared to be coming from the section where mass concrete was placed during the recent past major repairs near the left end of the structure.

The timbers on the face of the dam appear to be deteriorating. However, the timbers are large in size and a dam of this type normally deteriorates slowly, and failure is progressive and not sudden.

Planking on the upstream face of a dam of this type can fail fairly rapidly, particularly when pounded by heavy debris during storm flow conditions. When this happens, the hole in the planking allows for free discharge of stored water down into and thru the crib section of the dam.

Conditions observed at this dam on August 22, 1968 indicate that the dam is in satisfactory condition. It is possible that maintenance will be required in the not too distant future should the crest begin to sag more noticeably or planking fails.

Bear Hole Dam

Seepage thru the rock toe fill was observed on both the right and the left side of the conduit. Seepage observed was greatly reduced when compared to the quantity of seepage observed during the July inspection and reported on July 10th.

There was no evidence of any fine grained material being moved with the seepage. On the right side of the conduit just above the discharge end of this concrete structure, there was hardly any seepage taking place. At the left side of the conduit, seepage was at about the same rate as noted at the time of previous periodic inspections.

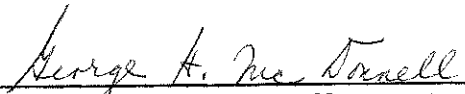
The water level in the reservoir on August 22nd was within a very few inches of the elevation observed in July. Consequently,

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for all practical purposes, the head of water which could affect seepage was the same at both inspections. It is concluded therefore, that the large quantity of seepage noted in July was related to surface run-off from the gutter of the access roadway to the west of the reservoir and ground water from the westerly side hill.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

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CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD West Springfield
December 31, 1969

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Each dam situated within the Town of West Springfield was inspected at least once during the year 1969. Inspections were made from time to time with the final inspection being made at the Lyncosky Dams on December 29, 1969. The following is a report on the condition noted at each of the dams located within the Town of West Springfield.

A. Strathmore Paper Co. Dam

This dam situated across Westfield River and located between Agawam and West Springfield, was inspected on September 30, 1969 at the time the dams in Agawam were inspected.

The alignment of the wooden crest is somewhat irregular. The grade of the crest was noted to vary across the length of the dam. Two crest areas are low and at the time of inspection the flow of the river passed over the crest at these two areas. One area is at about the center of the dam and the other near the right side.

The ends of timbers at the right side of the dam are rotting and crushing from the weight of the surcharge from above.

The right abutment masonry is in fairly good condition. The left abutment is satisfactory. Masonry is okay and the headworks of the canal were good.

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The toe of the dam in the riverbed appears to be in good condition. However, the main timbers of the dam appear to be rotting and as a result, permit settlement and local failure of the timbers from the weight of those above.

The repaired section of the dam located at the left side or end appears to be holding up quite well.

Though timbers are crushing and there is evidence of mis-alignment and settlement of the crest, in the opinion of the undersigned the dam is satisfactory for the present.

B. Mittineague Park Dams

Upper Dam - This small dam is in the same general condition as was reported in previous years. Hardly any water is stored by the small masonry structure and the pond volume has been nearly filled with sand and gravel washed down from upstream by previous storm flows.

The dam is low, only about 4 feet in height, above the toe at stream bed level.

The dam is the type of structure that will not go out suddenly. If it fails at all, it will fail slowly through long time deterioration.

Since the dam stores an insignificant quantity of water and failure couldn't do any damage to persons or property downstream, no inspections will be made after 1970 unless the undersigned is instructed to the contrary, or unless, during the inspection in 1970, field conditions indicate the advisability of continuing annual inspections of the dam.

Lower Dam - This dam is in similar condition as described for the upper dam. It is a small structure and forms a small pond that is shallow in depth. The structure has been built of concrete and stone masonry. It can withstand deterioration without sudden failure.

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As reported previously, the masonry is in need of touching up and minor repairs at various locations. However, because the dam ponds such a small quantity of water, and, because the pond is shallow, it does not endanger persons and property downstream.

As recommended in the case of the upper dam, the lower dam will be dropped from the inspection schedule following the 1970 inspection unless the undersigned receives instructions to the contrary or unless field conditions in 1970 indicate that continuation of inspections would be desirable.

C. Country Club Dam

This dam was inspected early in the spring of 1969 and found to be in the same general condition as reported in July of last year. At that time the embankment forming the dam was okay and the road across the top was in good condition. The tube through the embankment was satisfactory. Joints at the sections of the spillway tube were seeping some water but not enough to be of any particular concern. Little or no earth was being moved with the seepage water.

The toe area of the dam was satisfactory. The old spillway was in satisfactory condition but will need masonry repairs in a few years.

The new concrete shaft spillway was in fairly good condition.

The undersigned attempted a reinspection of the dam on Monday, December 29, when the Lyncosky Dams were inspected. However, snow cover was so thick that it was not possible to make the desired inspection. Consequently, the next inspection of the Country Club Dam has been scheduled for the spring of 1970.

D. Lyncosky Dams

Upper Dam - This small dam is in the same general condition as reported previously. It is my opinion that it does not come under county jurisdiction, but since it is directly upstream of the lower dam, a report is submitted on the general condition of the upper dam.

The embankment forming the upper dam is wide for its low height. It carries the access road leading to the garage area and to the housing facilities located on the right bank of the pond formed by the lower dam.

Even if flood flows should exceed the capacity of the small spillway tube through the upper dam, excess flows could pass over the dam embankment and across the roadway without doing any substantial damage to the dam.

Lower Dam - The embankment forming this dam is well shaped and the toe area was good. Water level in storage was at the spillway crest and the spillway was operating. The pond was covered with ice except for the spillway area.

The usual wooden bar rack was on the crest of the spillway. The bar rack was clean and free of debris. It was operating satisfactorily.

The spillway tube also was free and clear of any debris.

In the opinion of the undersigned, the lower dam is in satisfactory condition and was safe.

E. Piper Reservoir Dam (New Swimming Pool Dam)

This dam was inspected on December 17, 1969. The embankment was noted to be okay. It was satisfactory as to shape and little or no surface erosion was observed. The downstream slope was satisfactory.

The toe area of the earth embankment was inundated by the downstream skating rink which had been flooded prior to the inspection date. This is a usual late fall occurrence each year.

The shaft spillway was in the same general condition as previously reported. Water level in storage was at normal elevation and water was passing from the pond through the spillway facility opening.

The downstream end of the spillway tube was flooded by the backed up water formed by the downstream skating rink.

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In yearspast, this dam formed a body of water used for swimming purposes. However, the Town of West Springfield has since built an artificial swimming pool on the left bank of the stream just above the dam and all swimming is now done in this artificial concrete standard type municipal pool. Little or no use is made now of the dam and the pond formed by the dam.

In the opinion of the undersigned, the Piper Reservoir Dam is in satisfactory condition and is safe.

F. Bear Hole Dam

The embankment forming this dam was found to be in satisfactory condition. It is well shaped and the roadway across the top of the dam appeared to be okay. There was no settlement or cracking observed.

Seepage at the toe of the dam embankment was about normal.

There was no movement of soil particles with the seepage water. Most of the seepage occurred to the left of the discharge end of the conduit.


Water level in storage was normal and thus full head of the reservoir was on the dam.

The concrete masonry of the spillway structure was okay. No breaks were noted and no flashboards were on the crest.

There was no erosion in the stream bed at the discharge end of the conduit.

In the opinion of the undersigned the dam is in good condition and is safe.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/jh

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD West Springfield
July 27, 1970

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Each dam located within the Town of West Springfield has been inspected at least once during the year 1970. Inspections were made from time to time, with the final inspection being made on July 17, 1970. The following is a report on the condition noted at each of the dams located within the Town of West Springfield.

A. Strathmore Paper Co. Dam

The abutment areas at this dam are in fair condition. However, the old log crib and plank dam is only in fair condition. The crest sags at two locations, probably the result of settlement and crushing of some of the old logs and timbers forming the crib construction. Leakage was observed at a number of places along the toe area of the dam.

The volume of storage in the stream behind the dam is not very great since much of the volume has been filled in with material washed down from upstream and other material used for coffer dam construction in the past when repairs were made to the crib dam.

The repaired section of the dam located at the left end appears to be holding up fairly well.

The canal headworks were observed to be in satisfactory condition. The head gate openings were wide open and river water flowed into the canal as well as over the crest of the dam at the location of the

two sag areas. One of the canal drawdown gates was partly open and water discharged from the canal. The canal spillway was in fair condition.

Water level flowing in the canal was below normal elevation, probably as a result of a lowered elevation of the pond behind the dam due to discharge of water over the crest of the dam thru the two sag locations.

It is possible that a failure in the dam could occur again as has been experienced in the past. A failure of this sort will not endanger persons and property downstream since the amount of water that would be released could be handled very easily in the stream bed. The stream bed below the dam is quite wide and dry.

The only danger to any such failure would come about if a person happened to be in the bed of the stream directly in the front of the timber crib dam when failure of a section occurred.

In the opinion of the undersigned, the owner of the dam should make frequent inspections of the dam and if there is evidence that further settling and crushing is occurring, steps should be taken to repair that portion of the timber crib dam that is affected.

B. Mittineague Park Dams

Upper Dam

The drainpipes were found to be open at this small dam and no water was stored. The pond volume behind the dam has been completely filled up with silt and earth washed in from upstream. The masonry top section of the spillway is o.k. but the cobblestone masonry at the base of this small dam and the cemented cobblestone apron were noted to be eroded, broken and in poor condition.

Since this dam stores an insignificant quantity of water and since failure of this small dam could not do any damage to persons and property downstream, no further inspections will be made of this dam unless the undersigned is advised to the contrary.

Lower Dam

This dam is inactive and the drainpipe is open. Masonry construction forming the dam is in fair condition.

As in the case of the Upper Dam, little or no water is stored by this Lower Dam and much of the pond volume has been filled in by material washed in from upstream.

The dam stores such a small quantity of water and since the depth of the pond is extremely shallow, the dam does not endanger persons and property downstream.

As mentioned in my report of a year ago, this dam will be dropped from the inspection schedule unless the undersigned is advised to the contrary. I see no further need for inspecting this small dam in Mittineague Park.

C. Country Club Dam

The embankment forming this dam was in good condition. The toe area was found to be dry. The turf surfaces on the slopes and at the edges of the roadway along the embankment were in good condition.

The old spillway facility was operating and water level in storage was at the top of the upper stoplog. The masonry of the old spillway is in fair condition. Some debris was in the spillway inlet but the condition is not dangerous.

The flood flow spillway shaft was in good condition. The tube was examined from end to end and found to be o.k.

The first joint in the tube thru the embankment located upstream from the portal end of the tube shows signs of opening and failure of the joint repair work. The condition is o.k. for now but in another year it is possible that this joint may need repair work again. All joints in the flood flow spillway tube should be checked carefully in 1971 and any repair work needed at that time should be done by the owner of the dam.

The stone filled toe area at the spillway outlet was in good condition.

No changes have been made at this dam since the time of the previous inspection and the structure was considered to be safe when checked.

D. Lyncosky Dams

Upper Dam

This small dam is in the same general condition as reported each year. As mentioned previously, it is my opinion that the dam does not come under County jurisdiction, but since it is directly upstream of the Lower Dam and, since it carries the access road to the Lower Dam, a report is submitted on the general condition of the Upper Dam.

The paved roadway and the embankment fill were observed to be in satisfactory condition. The embankment is quite shallow in height for its relatively large width. Even if high rates of surface runoff should exceed the capacity of the small spillway tube thru the upper dam embankment, excess flow would pass over the dam embankment and cross the roadway without doing any substantial damage to the dam.

In the opinion of the undersigned, this dam is in satisfactory condition.

Lower Dam

The embankment forming this dam is fairly well shaped and has a good growth of turf on its top. Side slopes are weed covered and there is a fairly heavy brush growth along the toe area.

Water level in storage was at the crest of the masonry overflow. The spillway inlet structure was o.k. There were no stoplogs or flashboards on the crest. The spillway screen was in place and it was clean. There was no debris in the spillway inlet.

The outlet area of the spillway is rather dilapidated but it is serviceable.

No changes have been made at this dam since the time of the last inspection, and in the opinion of the undersigned, the dam is safe.

E. Piper Reservoir Dam (new Swimming Pool Dam)

The embankment forming this dam was satisfactory as to shape. The turf cover is very poor. In fact, it is almost non-existent. In spite of the fact that there is little or no turf cover, there is

very little evidence of any erosion on the surface of the embankment.

The spillway shaft was in satisfactory condition and water level in storage was at the crest of the hole thru the concrete wall of the shaft.

The tube spillway thru the embankment was o.k. There was no debris in the spillway pipe. The outlet end of the spillway was satisfactory.

In years past, this dam formed a body of water that was used for swimming purposes. However, the Town of West Springfield has since built an artificial swimming pool on the left bank of the stream just above the dam and all swimming is now done in this artificial concrete, standard-type municipal pool. Little or no use is now made of the dam and the pond formed by the dam.

In the opinion of the undersigned, the Piper Reservoir Dam is in satisfactory condition and it is safe.

F. Bear Hole Dam

The spillway masonry at this dam was noted to be in good condition. On the day of inspection water level in storage was at the crest of the low side wall of the spillway structure. There were no flashboards on the side wall crests. The normal small metal stoplog plate was in the slots at the upper end of the spillway structure.

The walkway bridge out over the spillway was o.k.

The embankment was found to be in satisfactory condition. The gravel road along the top of the embankment was satisfactory. The toe areas of the embankment, one on each side of the spillway conduit outlet, were in good condition. Seepage was noted on each side of the conduit portal. The largest amount of seepage was observed on the left side. This is a normal condition.

The amount of seepage observed was about the same as noted in the past. There is no evidence of any movement of soil particles with the seepage water.

The rock filled toe area of the embankment was in good condition.


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-6-

The downstream slope of the embankment has very little turf cover. It is mostly weeds. There are areas of the embankment surface where there is no vegetation growth at all. However, no erosion was observed on these areas.

In the opinion of the undersigned, the dam is in good condition and it is safe.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd

West Springfield Water Works - Takings - 1893



1893 Reports

Location & Description of Land Taken for West Springfield Water Works - 1893. Recorded Hampden County Registry of Deeds October 18, 1893; James R. Wells, Register. Chapter 206, section 3, Acts for 1893.

Abutters	Sullivan, Daniel O
Abutters	Mahoney, John
Abutters	Lathrop, Elizabeth
Abutters	McCann, Mary
Abutters	Craig, E B
Abutters	Bartholomew, Clarence
Abutters	Calden, Daniel
Abutters	Day, Julius
City/Town	West Springfield
Streets	Amostown Road
Streets	Amostown Road
Streets	Piper Road
Streets	King's Highway
Streets	Westfield Road
Water	Lathrop Spring
Water	Birmie Reservoir

LOCATION AND DESCRIPTION
OF
LAND TAKEN
FOR
WEST SPRINGFIELD WATER WORKS
1893.

LOCATION AND DESCRIPTION

OF

LAND AND RIGHT OF WAY TAKEN

FOR

WEST SPRINGFIELD WATER WORKS.

-----000-----

Filed and recorded in Hampden County Registry of Deeds
as required by Section 3, Chapter 206 of the Acts of
the Legislature of Massachusetts for 1893.



PIPER ROAD

MARY M^cCANN

E. B. CRAIG

TOWN OF WEST SPRINGFIELD

AMOSTOWN ROAD

MARY M^cCANN

KING'S HIGHWAY

PIPE LINE

S. A. MOSELEY

PLAN
SHOWING RIGHT OF WAY FOR PIPE LINE
THROUGH LAND OF
MARY M^cCANN
FROM
AMOSTOWN ROAD
TO
KING'S HIGHWAY.

GEO. N. MERRILL C. E.
SCALE, 1 INCH = 100 FEET.

OCT. 1893.

The Town of West Springfield, acting by its Board of Water Commissioners in accordance with authority given by the Legislature of the Commonwealth of Massachusetts Chapter 206, Section 2 of the Acts of 1893, have taken the following described land and right of way for the purpose of supplying the said Town and the inhabitants thereof with pure water, and for the construction and maintenance of proper dams, reservoirs, buildings, fixtures, and other structures for the establishment and maintenance of complete and effective water works, and for the purpose of holding and preserving the purity of such water supply, and for conveying the same to any part of the Town of West Springfield.

-----000-----

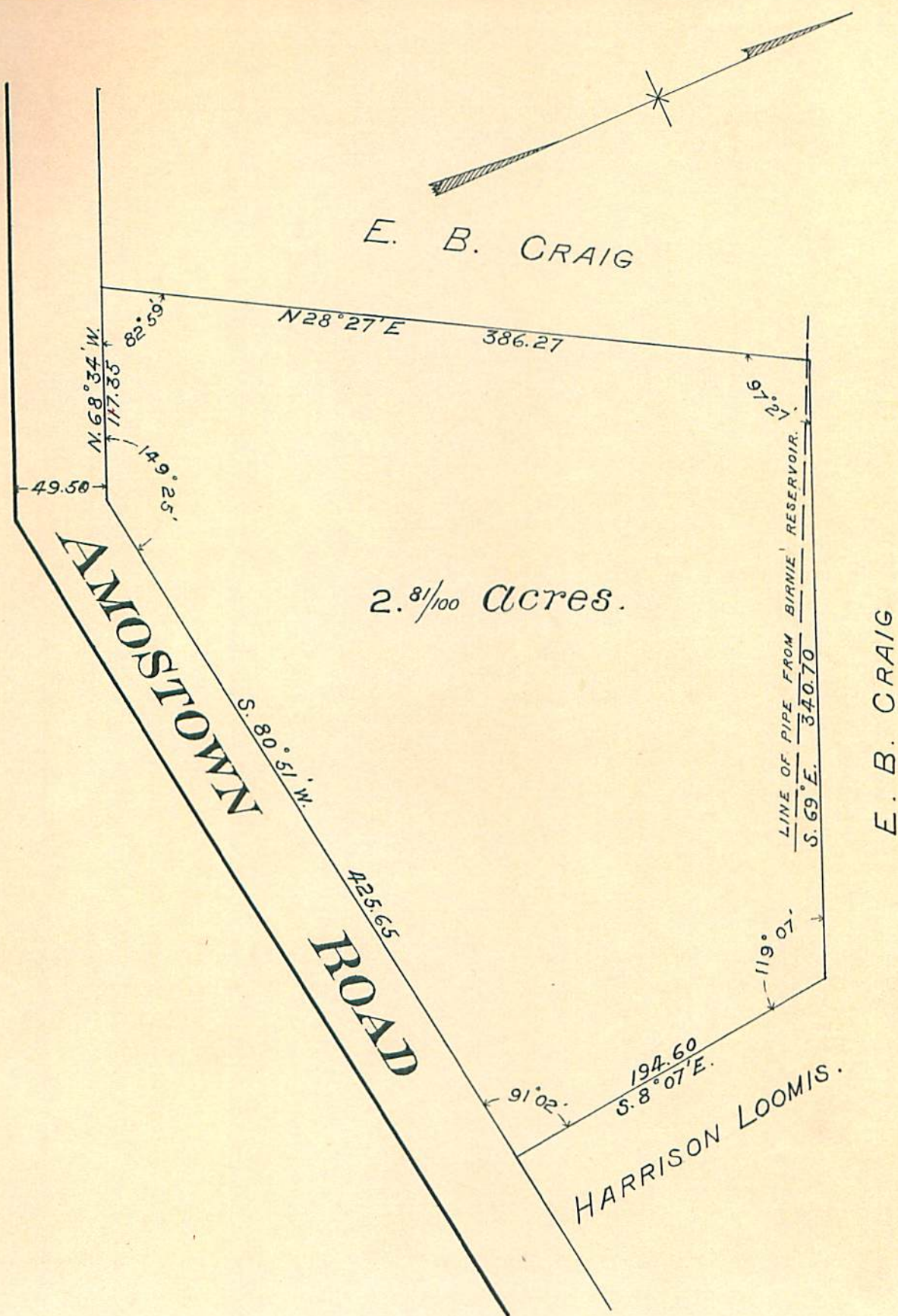
All the lands and right of way so taken being situated within the limits of Town of West Springfield, Hampden County, Massachusetts.

1
Description of land of E. B. Craig situated in West
Springfield, taken August 8 th., 1893.

Beginning at an iron pipe driven into the ground at
the southwest corner of land of Harrison Loomis on the
northerly side of the Amostown road (so called); thence
S 80 degrees 51' W on the north side of said road
425.65 ft.; thence N 68 degrees 34' W on the north
side of said road 117.35 ft. to an iron pipe driven
into the ground; thence N 28 degrees 27' E on land of
E. B. Craig 386.27 ft. to an iron pipe driven into the
ground; thence S 69 degrees E on land of said Craig
340.70 ft. to land of said Harrison Loomis at an iron
pipe driven in the ground; thence S 8 degrees 07' E on
land of said Loomis 194.60 ft. to the place of beginning.
Containing 2.81 acres of land.

-----000-----

The purpose for which this land is taken is to secure
for the water supply of said West Springfield, the
springs upon said land, and for the construction and
maintenance upon said land at all times of suitable
structures, buildings, and fixtures for the establish-
ment and maintenance of complete and effective water
works for the conduct, storage and supply of water.



PLAN OF LAND
TAKEN FROM
E. B. CRAIG
GEO. N. MERRILL C.E.
SCALE 1 INCH = 80 FEET
OCT. 1893.

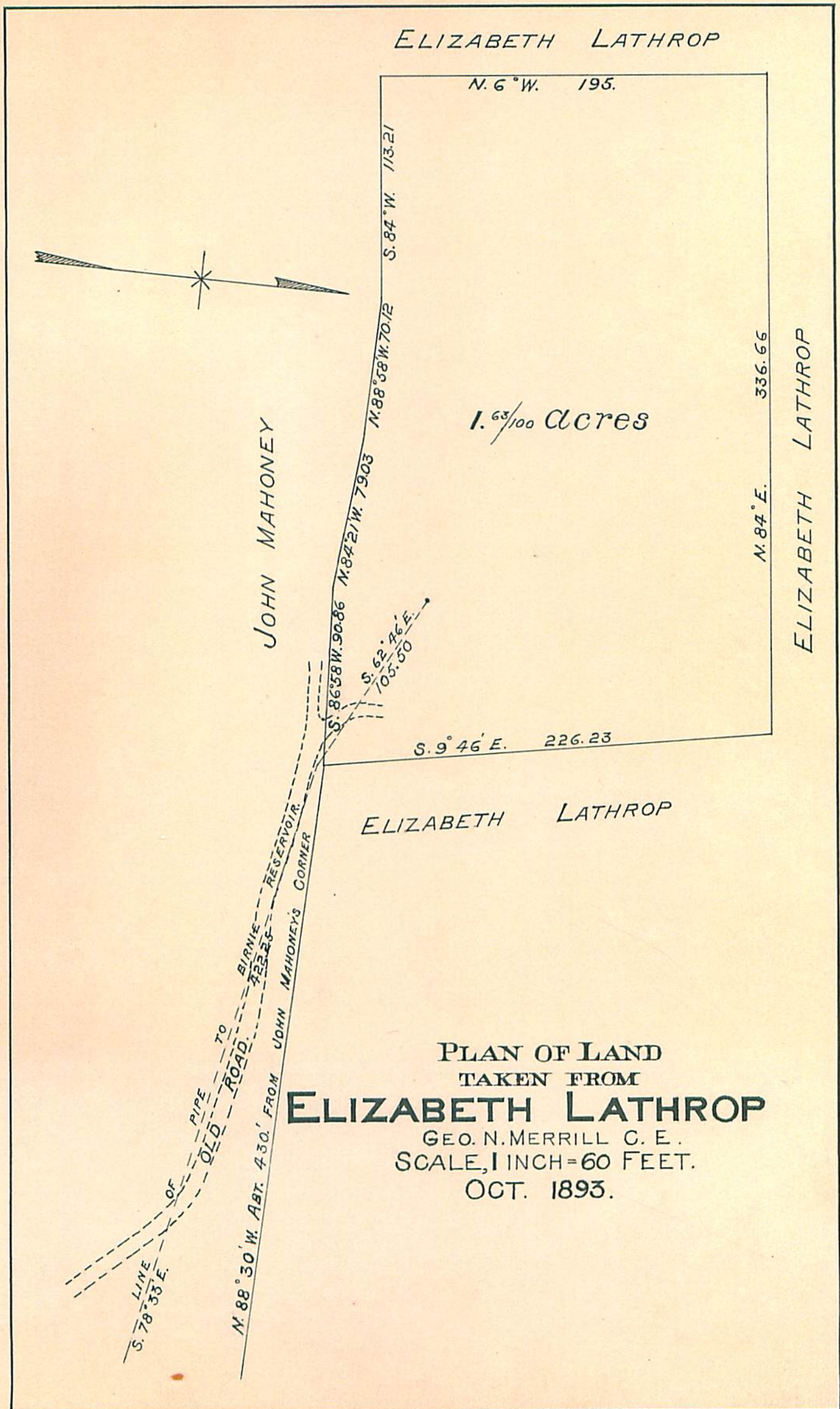
3

We certify that the above is a description of the
location and boundaries of land taken from E. B. Craig
under the provision of Chapter 206, Section 2 of the
Acts of 1893, and for the purpose as heretofore stated.
Dated August 8 th., 1893.

N. J. Smith
Hyander Grant

} Water Commissioners
of
West Springfield.

Received and Filed with Hampden County Deeds.
Oct. 6th 1893.
Attest James R. Wells. Register



PLAN OF LAND
TAKEN FROM
ELIZABETH LATHROP
GEO. N. MERRILL C. E.
SCALE, 1 INCH = 60 FEET.
OCT. 1893.

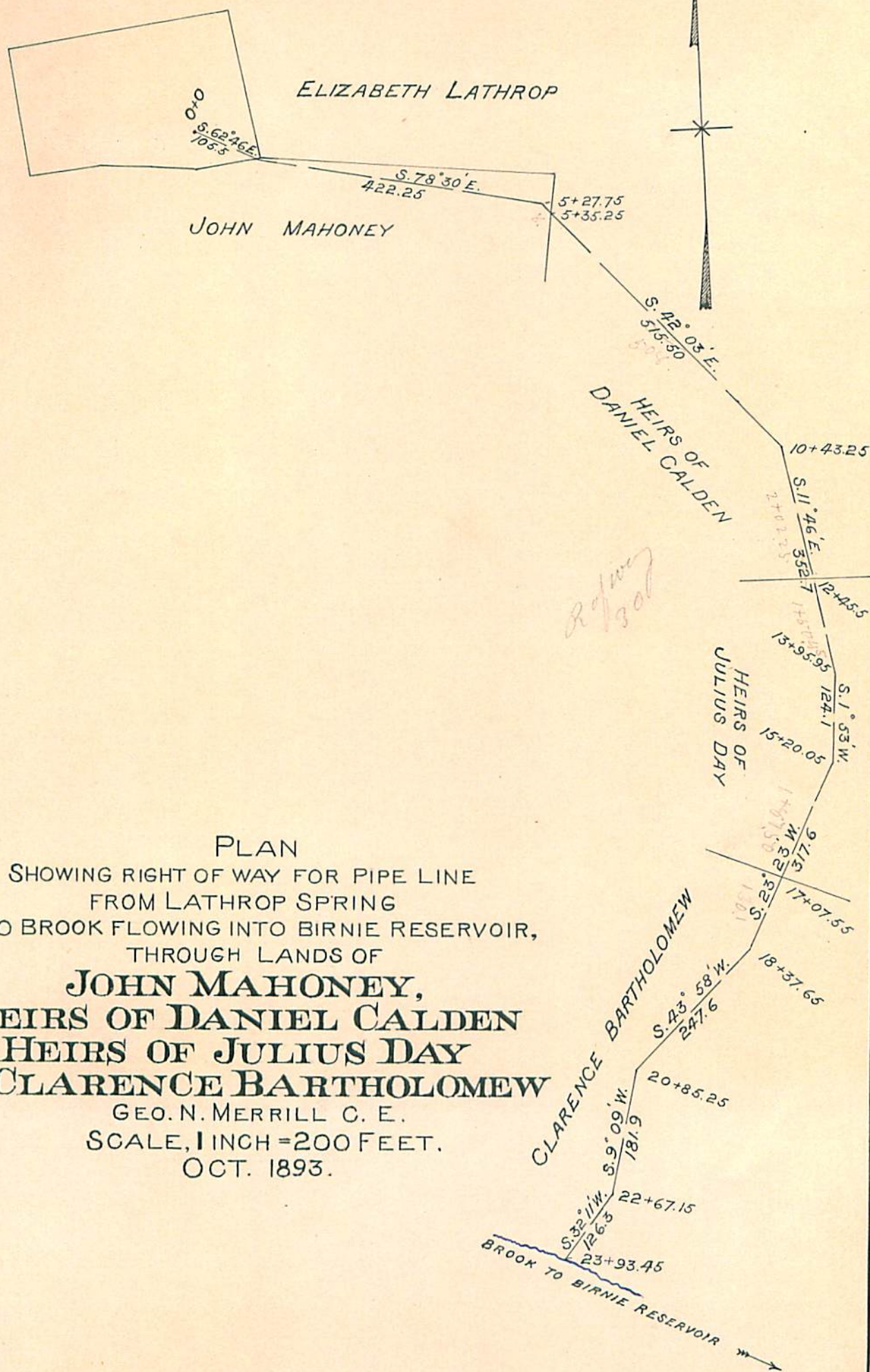
5

Description of land of Elizabeth Lathrop situated in West
Springfield, taken -

Beginning at the southeast corner of the land taken, at a
point on the north line of land of John Mahoney about 430 ft.
westerly ^{of} said Mahoney's northeast corner; thence S 86 degrees
58' W on land of Mahoney 90.86 ft.; thence N 84 degrees 21' W
79.03 ft.; thence N 88 degrees 58' W 70.12 ft.; thence S 84
degrees W, still on the north line of Mahoney, 113.28 ft. to
an iron pin; thence N 6 degrees W on land of Elizabeth Lath-
rop 195 ft. to an iron pin; thence N 84 degrees E 336.66 ft.
on land of said Elizabeth Lathrop to an iron pin; thence S 9
degrees 46' E on land of said Elizabeth Lathrop 226.23 ft.
to the place of beginning; containing 1.63 acres.

-----000-----

The purpose for which this land is taken is to secure for the
water supply of said West Springfield, the springs upon said
land, and for the construction and maintenance upon said
land at all times of suitable structures, buildings and
fixtures for the establishment and maintenance of complete
and effective water works for the conduct, storage and
supply of water.



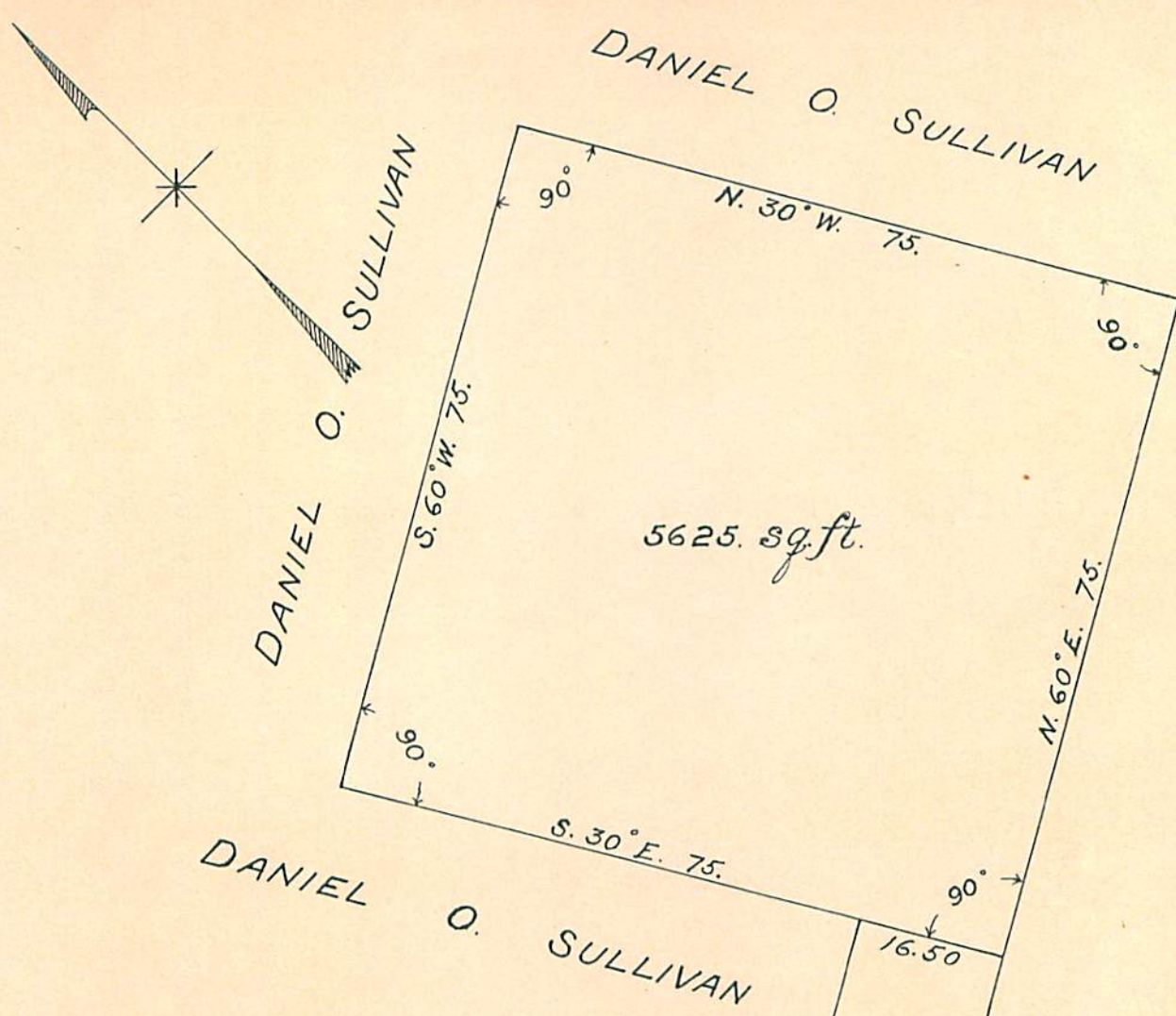
PLAN
 SHOWING RIGHT OF WAY FOR PIPE LINE
 FROM LATHROP SPRING
 TO BROOK FLOWING INTO BIRNIE RESERVOIR,
 THROUGH LANDS OF
JOHN MAHONEY,
HEIRS OF DANIEL CALDEN
HEIRS OF JULIUS DAY
& CLARENCE BARTHOLOMEW
 GEO. N. MERRILL C. E.
 SCALE, 1 INCH = 200 FEET.
 OCT. 1893.

7

Rights of way taken as shown on annexed plan.

The Town of West Springfield, acting by its Board of Water Commissioners, have taken, and do hereby take the right of way over the herein described lands situated in the Town of West Springfield, to wit,- a certain piece or strip of land 30 ft. wide, extending from land taken from Elizabeth Lathrop, easterly and southerly through land of Elizabeth Lathrop, John Mahoney, Heirs of Daniel Calden, Heirs of Julius Day, and of Clarence Bartholomew, to a brook leading to Birnie Reservoir,- meaning and intending to take a Right of Way to lay and forever maintain a line or lines of pipe for the purpose of conveying water from the land taken of Elizabeth Lathrop, to the brook flowing into Birnie Reservoir, over any or all lands lying within 15 ft. on either side of a centre line of location, which centre line is located and defined as follows, to wit;-

Beginning at a station 1+05.5 as shown on the annexed plan, near the southeast corner of the land taken from Elizabeth Lathrop; thence S 78 degrees 30' E 422.25 ft. on land of John Mahoney and Elizabeth Lathrop; thence S 42 degrees 3' E 8.5 ft. to the division line between land of John Mahoney and land of the Heirs of Daniel Calden; thence in the same course 508 ft. to an angle; thence S 11 degrees 46' E 222.05 ft. to the division line between land of the Heirs of Daniel Calden and land of the Heirs of Julius Day; thence on the same course (S 11 degrees 46' E) 150.45 ft. to an angle; thence S 1 degree 53' W 124.1 ft. to an angle; thence S 23 degrees 23' W 187.5 ft. to the division line between land of the Heirs of Julius Day and land of Clarence Bartholomew; thence in the same course (S 23 degrees 23' W) 130.1 ft. to an angle; thence S 43 degrees 58' W 247.6 ft. to an angle; thence S 9 degrees 09' W 181.9 ft. to an angle; thence S 32 degrees 11' W 126.3 ft. to the brook before mentioned.



PLAN OF LAND
TAKEN FROM
DANIEL O. SULLIVAN
GEO. N. MERRILL C.E.
SCALE, 1 INCH=20 FT.
OCT. 1893.

WESTFIELD ROAD

Description of land taken from Daniel O. Sullivan situated in West Springfield.

Beginning at an iron rod on the line between land formerly of Robert Bible, and land of Daniel O. Sullivan, 110 ft. from the northeasterly side of the Westfield Road; thence N 60 degrees E on said land formerly of Robert Bible 75 ft. to an iron rod; thence N 30 degrees W 75 ft. to an iron rod; thence S 60 degrees W 75 ft. to an iron rod; thence S 30 degrees E 75 ft. to the place of beginning; containing 5625 square feet of land.

-----000-----

The purpose for which this land is taken, is for the construction and maintenance upon said land at all times of stand pipe and suitable structures, buildings and fixtures for the establishment and maintenance of complete and effective water works for the conduct, storage and supply of water.

11

Right of way taken over land of Daniel O. Sullivan, from land taken of Daniel O. Sullivan to the Westfield Road for the purpose of laying and forever maintaining a line or lines of pipe for the purpose of conveying water from land taken from Daniel O. Sullivan to the Westfield Road over the same.

A right of way is taken over the following land.

A strip of land 16 1/2 ft. wide, leading from the Westfield Road northeasterly to the land taken from Daniel O. Sullivan, and bounded on the southeasterly by land formerly of Robert Bible, as shown on the annexed plan.

We certify that the foregoing is a description of the location and boundaries of land and rights of way taken under the provisions of Chapter 206, Section 2 of the Acts of 1893, and for the purposes as hereinbefore stated.

Norman L Smith
Alexander Grant } Water Commissioners
of
West Springfield.

Received ^{and} Filed with Hampden County Records
Oct. 18th 1893 Attest James R. Wells. Register.

West Springfield - Bear Hole Dam - 1956

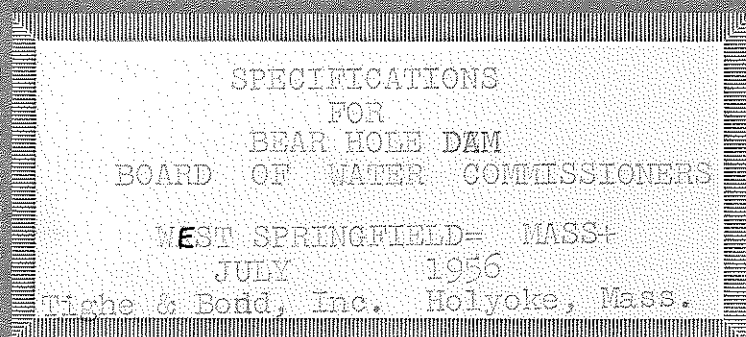


1956 Reports

Report filed July 10, 1956 by Tighe & Bond. Specifications for Bear Hole Dam - Board of Water Commissioners - 1956.

City/Town	West Springfield
Dam	Bear Hole Dam

d25 095



Filed - July 10, 1956

Hampden County Commis' Office.

See "Special Provisions"
(Blue sheet) - between sheets 31 and 32
for County Commissioners'
Approval.

BOARD OF WATER COMMISSIONERS
TOWN OF WEST SPRINGFIELD, MASS.

* * * * *

ADVERTISEMENT FOR BIDDERS

Sealed proposals addressed to the Board of Water Commissioners, Town Hall, West Springfield, Mass., and endorsed "Proposal for Bear Hole Dam", will be received by the Board of Water Commissioners at their office until 9:00 P.M. (D.S.T.) Monday, July 16, 1956, and at that time and place publicly opened and read aloud. Proposal Guaranty: From General Contractors, \$7,500.00. Complete information and proposal forms may be secured at the office of Tighe & Bond, Pequot & Bowers Streets, Holyoke, Mass. Charge for plans and proposal forms, \$20.00; amount allowable to bidders who return plans in seven (7) days after opening of bids. Minimum wage rates have been established. Performance and Payment Bond in the full amount of the contract will be required by the Town from the General Contractor. Right reserved to waive any informality in and reject any or all proposals or accept proposal deemed most satisfactory to owner, if it be in the public interest so to do. No proposal may be withdrawn within thirty (30) days after actual date of opening thereof.

BOARD OF WATER COMMISSIONERS
TOWN OF WEST SPRINGFIELD, MASS.

**PROPOSAL
FORM**



**TIGHE & BOND
CONSULTING ENGINEERS
HOLYOKE, MASS.**

BOARD OF WATER COMMISSIONERS
TOWN OF WEST SPRINGFIELD, MASS.

* * * * *

PROPOSAL

For the furnishing of all materials and the doing of all work as herein described, required for or necessary to the construction of the concrete spillway and earthen dam on Paucatuck Brook at the Bear Hole Water Supply Facility in the Town of West Springfield, Mass.

To the Board of Water Commissioners
Town of West Springfield, Mass.

The undersigned as bidder, declares that the only persons or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any other person, firm or corporation; that he has carefully examined the location of the proposed work, has taken into full consideration all difficulties likely to be met with in doing of the work; that he has also carefully examined the proposed specifications and plans therein referred to; and he proposes and agrees, if this proposal is accepted, that he will contract with the Board of Water Commissioners, Town of West Springfield, Mass., in the form of Contract annexed, to provide all necessary machinery, tools, apparatus, materials, labor and other means of construction, and to do all the work and to furnish all the materials specified in the Contract, in the manner and time herein prescribed, and according to the requirements of the Engineer as herein set forth, and that he will take in payment therefor the following sum or sums, to wit:

ITEM APPROX. No.	QUANTITY	DESCRIPTION WITH UNIT WITTEN IN WORDS AND FIGURES	BID PRICE	AMOUNT OF ITEMS DOLLARS CENTS
1	lump sum	For the miscellaneous work of preparing the construction site, control of water and cleaning up after the completion of construction, including all labor, equipment and materials required for or incidental to the item as herein described, the sum of:		
			(\$ _____)	\$ _____

ITEM NO.	APPROX. QUANTITY	DESCRIPTION WITH UNIT BID PRICE WRITTEN IN WORDS AND FIGURES	AMOUNT OF ITEMS DOLLARS CENTS
2	0.25 acres	For clearing and grubbing the dam site and borrow pit areas as herein described, including all labor, equipment and materials required for or incidental to the item, the sum of:	
		(\$)	\$
3	8500 cu. yds.	For each cubic yard of earth excavation as hereinafter described, including all labor, equipment and materials required for or incidental to the item, the sum of:	
		(\$)	\$
4	100 cu. yds.	For each cubic yard of rock excavation as hereinafter described, including all labor, equipment and materials required for or incidental to the item, the sum of:	
		(\$)	\$
5	1100 cu. yds.	For each cubic yard of 3,000 psi concrete furnished in place in the completed work as hereinafter described, including all labor, equipment and materials, required for or incidental to the item, the sum of:	
		(\$)	\$
6	400 cu. yds.	In addition to payment under Item 5, for each cubic yard to which is added an integral waterproofing admixture as directed by the Engineer and as herein specified, including all labor, equipment and materials required for or incidental to the item, the sum of:	
		(\$)	\$

ITEM NO.	APPROX. QUANTITY	DESCRIPTION WITH UNIT BID PRICE WRITTEN IN WORDS AND FIGURES	AMOUNT OF ITEMS	
			DOLLARS	CENTS
7	10 cu. yds.	For each cubic yard of insulating concrete furnished in place in the completed work as hereinafter described, including all labor, equipment and materials required for or incidental to the item, the sum of:		
		_____	\$	
		(\$)		
8	90 tons	For each ton of reinforcing steel bars or mesh furnished in place in accordance with the specifications, including all labor, equipment and materials required for or incidental to the item, the sum of:		
		_____	\$	
		(\$)		
9	2000 Bd. Ft.	For each board foot of structural lumber furnished in place in the completed work as hereinafter described, including all fastening devices and labor, equipment and material required for or incidental to the item, the sum of:		
		_____	\$	
		(\$)		
10	130 lin. ft.	For each linear foot of piperailing furnished in place in the completed work as hereinafter described or as ordered by the Engineer, including all labor, equipment and materials required for or incidental to the item, the sum of:		
		_____	\$	
		(\$)		
11	lump sum	For the installation of the water control equipment in the screen well and for other work as hereinafter described, including all labor, equipment and materials required for or incidental to the work, the sum of:		
		_____	\$	
		(\$)		

ITEM NO.	APPROX. QUANTITY	DESCRIPTION WITH UNIT BID PRICE WRITTEN IN WORDS AND FIGURES	AMOUNT OF ITEMS DOLLARS CENTS
12	365 lin. Ft.	For each linear foot of 24" Lock Joint Pipe, furnished by the Owner and laid by the Contractor, including all labor, equipment and materials required for or incidental to the item as hereinafter described, the sum of:	\$ _____
		(\$ _____)	
13	200 lin. Ft.	For each linear foot of 8" vitrified clay, extra-strength, perforated underdrainage pipe, furnished and placed by the Contractor, including all labor, equipment and materials required for or incidental to the item, the sum of:	\$ _____
		(\$ _____)	
14	3000 cu. yds.	For each cubic yard of gravel borrow furnished in place by the Contractor as hereinafter described, including all labor, equipment and materials required for or incidental to the item, the sum of:	\$ _____
		(\$ _____)	
15	40 tons	For each ton of filter stone borrow furnished in place in the completed work, as hereinafter described, including all labor, equipment and materials required for or incidental to the item, the sum of:	\$ _____
		(\$ _____)	
16	1500 tons	For each ton of trap rock furnished as riprap in accordance with the specifications, including all labor, equipment and materials, required for or incidental to the work, the sum of:	\$ _____
		(\$ _____)	

ITEM NO.	APPROX. QUANTITY	DESCRIPTION WITH UNIT BID PRICE WRITTEN IN WORDS AND FIGURES	AMOUNT OF ITEMS DOLLARS CENTS
17	1200 lbs.	For each pound of cast iron furnished in place in accordance with the specifications, including all labor, equipment and materials required for or incidental to the item, the sum of:	\$ _____
		(\$ _____)	
18	100 lbs.	For each pound of aluminum furnished in place in accordance with the specifications, including all labor, equipment and materials, required for or incidental to the work, the sum of:	\$ _____
		(\$ _____)	
19	1600 cu. yds.	For each cubic yard of <u>select pervious</u> fill obtained from local borrow pits as hereinafter described, including all labor, equipment and materials required for or incidental to the excavation, hauling and placing in the completed work of this fill, the sum of:	\$ _____
		(\$ _____)	
20	cu. yds.	For each cubic yard of <u>random pervious</u> fill obtained from local borrow pits as hereinafter described, including all labor, equipment and materials required for or incidental to the excavation, hauling and placing in the completed work of this fill, the sum of:	\$ _____
		(\$ _____)	
21	6000 cu. yds.	For each cubic yard of <u>semi-pervious</u> fill obtained from local borrow pits as hereinafter described, including all labor, equipment and materials required for or incidental to the excavation, hauling and placing in the completed work of this fill, the sum of:	\$ _____
		(\$ _____)	

ITEM NO.	APPROX. QUANTITY	DESCRIPTION WITH UNIT BID PRICE WRITTEN IN WORDS AND FIGURES	AMOUNT OF ITEMS DOLLARS CENTS
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22 3500
cu. yds. For each cubic yard of Impervious fill obtained from local borrow pits as hereinafter described, including all labor, equipment and materials required for or incidental to the excavation, hauling and placing in the completed work of this fill, the sum of:

\$ _____
(\$)

23 5000
sq. yds. For each square yard of loaming, fine grading, fertilizing and seeding as hereinafter described including all labor, equipment and materials required for or incidental to the item, the sum of:

\$ _____
(\$)

TOTAL AMOUNT OF BID

Items 1 - 23 Inclusive \$ _____

The work under this contract will be substantially completed and the pipeline, having passed the required leakage tests, placed in operation within

() calendar days from the date of signing of the Contract.

The hereinabove and hereinbefore listed prices are to include and cover the furnishing of all materials, the performing of all labor, requisite or proper, and providing of all necessary machinery, tools, apparatus and other means of construction, and the doing of all the above-mentioned work in the manner set forth, described and shown in the specifications and in the drawings for the work, and in the form of Contract.

If this proposal shall be accepted and the undersigned shall fail to contract as aforesaid and to give a bond in the sum to be determined as aforesaid with a surety satisfactory to the Owner, within ten (10) days (not including Sunday) from the date of mailing of a notice from the Owner to him, according to the

address herewith given, that the contract is ready for signature the Owner may, at its option, determine that the bidder has abandoned the contract, and thereupon this proposal and its acceptance thereof shall be null and void; and the proposal guaranty submitted, covering this proposal, shall become the property of the Town of West Springfield; otherwise the said proposal guaranty shall be returned to the undersigned.

SIGNATURE OF BIDDER: _____

BUSINESS ADDRESS: {

PLACE OF RESIDENCE: {

DATE: _____

The full names and residences of all the persons and parties interested in the foregoing proposals are as follows:

*(Notice - give first and last names in full; in case of Corporations, give names of President, Treasurer and Manager, and in case of firms give the names of the individual members.)

The proposed surety Company on the bond to be given is as follows:

Name: _____

Address of Home Office: _____

Massachusetts Office: _____

GENERAL REQUIREMENTS



**TIGHE & BOND
CONSULTING ENGINEERS
HOLYOKE, MASS.**

GENERAL REQUIREMENTS

.....

DEFINITION OF TERMS

Article 1. Definition of Terms.

Wherever in these specifications of other contractual documents the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as follows:

- Addendum An addition to or alteration of the Plans and/or Specifications generally issued for clarification purposes prior to the opening of proposals.
- Advertisement ... The notice published in newspapers and trade bulletins announcing the time and place for the opening of bids for work to be done.
- A.A.S.H.O. The American Association of State Highway Officials.
- Alteration Change in the form or character of any of the work done or to be done.
- A.S.T.M. The American Society for Testing Materials.
- Bidder Any individual, firm or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.
- Contractor A party to the contract, acting directly or through an authorized lawful agent or employee.
- Engineer The Consulting Engineer acting directly or through an authorized representative, such representative acting within the scope of the particular duties entrusted to him.
- Extra Work Work or materials not called for in the Plans and Specifications and which is deemed necessary for the proper completing of the improvement.
- Layout See Right of Way.
- Location See Right of Way.
- Material Any substance proposed to be used in connection with the construction of the project and its appurtenances.
- Owner The duly authorized official or officials in charge of the project.

PROPOSAL REQUIREMENTS AND CONDITIONS

Article 2. Contents of Proposal Forms.

Proposal forms consisting of the documents listed below will be furnished by the Owner to the bidder upon request at the office of the Engineer.

- A. The Specifications; including the Advertisement, General Requirements, Special Provisions, Standard Detail Drawings, Addenda, Proposal Form and Contract Form.
- B. The Plans.

Article 3. Interpretation of Basic Estimate of Quantities.

- A. All bids will be compared on the basis of the Engineer's estimate of quantities of work to be done, as shown in the Proposal.

These quantities are approximate only, being given as a basis for the comparison of bids, and the Owner does not expressly or by implication agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class, item or portion of the work, as may be deemed necessary or expedient by the Owner.

Bidders are required to submit their estimate upon the following express conditions, which shall apply to and become part of every bid received, viz:

An increase or decrease in the quantity for any item or group of items shall not be regarded as cause for an increase or decrease in the prices, nor in the time allowed for the completion of the work, except as provided in the contract. An increase or decrease in the quantity of work to be done shall not warrant any claim for loss, damage or anticipated profit.

- B. The work has been divided into classes and items in order to enable the bidder to bid on the different portions of the work in accordance with his estimate of their cost, so that in the event of an increase or decrease in the quantities of any particular class of work the actual quantities executed may be paid for at the price bid for that particular class of work.

Article 4. Examination of Plans and the Location.

Statements as to the condition under which the work is to be performed, including plans, surveys, measurements, dimensions, calculations, estimates, borings, etc., are made solely to furnish a basis for comparison of bids, and the Owner does not guarantee or represent that they are even approximately correct. The Contractor must satisfy himself by his own investigation and research regarding all conditions affecting the work to be done and labor and material needed, and make his bid in sole reliance thereon. The Contractor should carefully examine any materials furnished

Article 6. Delivery of Proposals.

Each Proposal shall be submitted to the Owner in a sealed envelope. On the outside of the envelope shall be written the bidder's name and address and the name of the project for which the bid is submitted.

If forwarded by mail, the sealed envelope containing the Proposal, and marked as directed above, must be enclosed in another envelope addressed to the Owner. The recommended method of mailing shall be "Registered-Return Receipt Requested."

Proposals received by the Owner at the designated place after the time designated in the Advertisement for Bidders will be returned to the bidder unopened.

It is the bidder's responsibility to see that his Proposal is at the designated place at the designated time. The Owner will not receive any Proposal not delivered to the designated place.

Article 7. Proposal Guaranty Required.

In order to insure the faithful fulfillment of its terms, each Proposal shall be accompanied by a certified check or lawful money as directed in the Special Provisions. Said check will be returned to the bidder unless retained by the Owner under the conditions hereinafter stipulated.

A bid bond will not be accepted as security.

Article 8. Public Opening of Proposals.

Proposals will be publicly opened and read aloud at the time and place indicated in the Advertisement for Bidders. Bidders or their authorized agents are invited to be present.

Article 9. Rejection of Proposals.

Proposals which fail to meet the requirements of Articles 5, 6 and 7, or which are incomplete, conditional or obscure, or which contain additions not called for, erasures, alterations or irregularities of any kind, or in which errors occur, or which contain abnormally high or abnormally low bid prices for any class of item of work, may be rejected as informal. The Owner may waive any informalities in or reject any or all bids and may accept any bid the Owner deems to be in his best interests or in the best interests of the group represented by the Owner.

More than one proposal from the same bidder, whether or not the same or different names appear on the signature page, will not be considered. Reasonable proof for believing that any bidder is so interested in more than one proposal for the work contemplated will cause the rejection of all proposals made by him directly or indirectly. Any or all proposals will be rejected if there is reason for believing that collusion exists among the bidders.

AWARD AND EXECUTION OF THE CONTRACT

Article 14. Consideration of Bids.

The Owner reserves the right to reject any or all proposals, to waive technicalities, and to advertise for new proposals, or proceed to do the work otherwise, as it may deem best for its own interests.

Article 15. Award of Contract.

The bids will be compared on the basis of the totals of the sums obtained by multiplying the Engineer's estimate of quantities by the unit price stated on the Proposal for each respective item.

The lowest bidders will be determined as described in the above paragraph. The responsible bidders will be determined as described in Articles 9, 11 and 12.

The Contract will be awarded to the lowest, responsible bidder as determined by the Owner.

The Contract will be awarded by the Owner as soon as practicable after the opening of bids. The successful bidder will be notified in writing, by mail, or otherwise, that his bid has been accepted and that he has been awarded the contract.

Article 16. Return of Proposal Guaranty.

The Proposal Guaranty will be returned to all except the three lowest formal bidders within three days after the opening of the bids. The Proposal Guaranty of each of the three lowest formal bidders will not be released by the Owner until after a Contract has been executed. Within three days after the signing of a Contract, the Proposal Guaranty of each of the three low bidders will be returned except as hereinafter provided.

The Proposal Guaranty submitted with any bid rejected as informal will be returned within three days of said rejection.

Article 17. Contract Bond Required.

Prior to the execution of the Contract, the Contractor will be required to furnish a surety bond in the amount specified in the Special Provisions as security for faithful performance of this Contract. The bond shall also guarantee payment of all persons performing labor on the project under this Contract and furnishing materials in connection with this Contract.

The bond must be in the usual and approved form and must also contain the following: "and shall pay for all labor performed or furnished and for all materials used or employed, and shall pay all persons who contract with the principal for labor and materials as provided in the

considered a part of the contract. In case of conflict between the said Special Provisions and General Requirements, the Special Provisions shall govern.

Article 22. Alteration of Work.

Should it be found desirable by the Engineer to make alterations in the form or character of any of the work done, or to be done, the Engineer may order such alterations to be made, defining them in writing, supplemented with drawings when in the opinion of the Engineer it is necessary, and the alterations shall be made accordingly; provided that in case such alterations increase the cost of the work the Contractor shall be remunerated at prices based on prices allowed on the same character of work under the specifications, and in case the alterations shall diminish the cost of the work no allowance will be made for anticipated profits.

In case of any alteration, change or addition to the work as originally contemplated, and if said alteration, change or addition justified an increase in the cost of the work, the Owner reserves the right to decide the method that will be used to determine said additional costs. (see Article 73.)

In case of any alterations, so much of the contract as is not necessarily affected by such alterations shall remain in force upon the parties thereto, and such alterations shall be made under the terms of and as a part of the contract, and the security for the performance of the contract shall in nowise be invalidated, but shall be held to secure in like manner the performance of the alterations made under the contract and of any extra work done under the provisions of Article 23.

The Contractor shall perform the work as increased or decreased within the qualifying limits named and subject to the provisions outlined above, but no allowance shall be made for any change in anticipated profits. Adjustments shall be considered waived unless specific complaint is made in writing by the Contractor previous to the construction of such alteration or change and within three calendar days following notice from the Owner of such alteration or change.

Article 23. Extra Work.

The Contractor shall do any work not herein otherwise provided for, when and as ordered in writing by the Engineer, such written order to contain particular reference to this article.

If the Contractor claims that any instructions from the Engineer involve extra cost or an extension of time, he shall so notify the Engineer in writing within three calendar days after the receipt of the Engineer's instructions and in any event before proceeding to execute the extra work. No claim from the Contractor will be considered valid unless made in accordance with the terms of this Article.

Such notice by the Contractor and the keeping of costs by the Engineer shall not in any way be construed as proving the validity of the claim.

Nothing in the contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or the soil; but all such materials shall, upon being so attached or affixed, become the property of the Owner.

Article 27. Final Cleaning Up.

Upon completion of the work and before acceptance and final payment, the Contractor shall remove, at his own expense, from the project location and from adjoining property, all temporary structures and all surplus material and rubbish which may have accumulated during the prosecution of the work, and shall leave the work broom clean and in a neat and orderly condition. The Contractor shall clean up the job so that the condition of the site will be at least equal to its condition before work began.

No equipment or materials shall be left on the right-of-way or project limits without the written permission of the Engineers.

CONTROL OF WORK

Article 28. Authority of the Engineer.

The Engineer shall decide all questions which may arise as to the quantity, quality, acceptability, fitness and rate of progress of the several kinds of work to be performed and materials to be furnished under the contract, and shall decide all questions which may arise as to the interpretation of any part of the contract, especially the plans and specifications which are a part thereof, as to the fulfillment of this contract on the part of the Contractor, and the determination and decision of the Engineer shall be final and conclusive; and such determination and decision, in case any question shall arise, shall be a condition precedent to the right of the Contractor to receive any money hereunder.

Article 29. Plans and Detail Drawings.

Approved plans, profiles and sections on file in the office of the Engineer will show the location, details and dimensions of the work contemplated, and all work shall be in strict conformity therewith and with the specifications.

Supplemental plans and detail drawings as required in the specifications and furnished by the Contractor shall upon approval become a part of the complete plans. Such approval of supplemental plans or detail drawings, however, shall not be construed as a complete check and shall not operate to relieve the Contractor of any of his responsibility under the contract for the satisfactory completion of the work, nor for the accuracy of the dimensions, details or quantities or for their agreement.

When submitting detail drawings for approval, complete sets of prints as directed shall be furnished the Engineer who will return one set either approved or with corrections marked thereon. Finally, the Contractor shall

or result from said work of public service corporations or municipal departments.

Article 33. Adjacent Contracts.

The Contractor shall carry on his work concurrently with that being done on other contracts or work (if any) adjacent to or in conjunction with the project, so as to provide for all possible cooperation towards the satisfactory completion of the work with a minimum of delay and inconvenience. Where necessary and insofar as possible he shall permit other contractors free and unobstructed passage over the work. He shall have no claim for or on account of any damage or delay due to the operations of other contractors or their movements over his section of the work.

Article 34. Construction Stakes.

The Contractor shall furnish, free of charge, all stakes and such temporary structures as may be necessary for marking and maintaining points and lines given by the Engineer for the building of the work, and shall give the said Engineer such facilities and materials for giving said lines and points as he may require; and the Engineer's marks shall be carefully preserved.

Article 35. Authority and Duties of Engineer's Assistants.

The Engineer may appoint such assistants and representatives as he desires and they shall be authorized to inspect work and materials, to give directions pertaining to the work or to the safety and convenience of the public, to approve or reject materials, to make measurements of quantities and to perform such other duties as may be designated by the Engineer.

In case of any dispute arising between the Contractor and the Engineer's assistants, as to materials furnished or the manner of performing the work, the Engineer's assistants shall have the authority to reject the materials or to suspend the work until the question at issue can be referred to and decided by the Engineer.

Engineer's assistants are not authorized to revoke, alter, enlarge, relax or release any requirements of these specifications, nor to issue instructions contrary to the plans and specifications. They shall in no case act as foreman or perform other duties for the Contractor.

Article 36. Inspection of Work and Materials.

The Engineers agents and employees of the Owner may for any purpose enter upon the work and premises used by the Contractor and the Contractor shall provide safe and proper facilities therefor.

The inspection of the work shall not relieve the Contractor of any of his obligations to fulfill the terms of the Contract as herein prescribed by the plans and the specifications.

tory completion of the project. The cost of so completing the work shall be deducted from any moneys due or which may become due the Contractor under the contract.

CONTROL OF MATERIALS

Article 39. Source of Supply and Quality.

The source of supply of each material shall be approved by the Engineer before delivery is started.

The Contractor shall furnish all materials required for the work specified in the contract, and said materials shall meet the requirements of the specifications for the kind of work involving their use.

Only new and first quality materials, conforming to the requirements of these specifications and approved by the Engineer shall be used in the work. If, after trial, it is found that sources of supply which have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved material from other approved sources.

The Contractor may be required to furnish sworn certificates as to quality and quantity of materials before said materials are incorporated in the work.

Article 40. Samples and Tests.

Tests of materials will be made by the Board or under its direction. The Contractor shall furnish such facilities as the Engineer may require for collecting and forwarding samples, and shall not make use of, or incorporate in the work, any material represented by the samples until the required tests have been made and the material accepted. The Contractor in all cases shall furnish the required samples without charge. Where tests are required of materials already incorporated in the work, the Contractor shall furnish samples, cut from the completed work at a time and as directed by the Engineer. The area affected by the removal shall be replaced and refinished, and the Contractor will receive no special compensation for any of the aforesaid work.

Article 41. Delivery and Storage of Materials.

Materials and equipment shall be progressively delivered at the site so that there will be neither delay in the progress of the work nor an accumulation of material that is not to be used within a reasonable time.

Materials shall be stored at the expense of the Contractor so as to insure the preservation of their quality and fitness for the work. When considered necessary by the Engineer, they shall be placed on wooden platforms or other hard clean surfaces, and not on the ground, and shall be placed under cover when directed. Stored materials shall be so located as to facilitate prompt inspection.

No cancellation of such insurance, whether by the insurer or by the insured, shall be valid unless written notice thereof is given by the party proposing cancellation to the other party and to the officer or agent who awarded the contract at least fifteen days prior to the intended effective date thereof, which date shall be expressed in said notice. Notice of cancellation sent by the party proposing cancellation, by registered mail, postage prepaid, with a return receipt of the addressee requested, shall be sufficient notice. An affidavit of any officer, agent or employee of the insurer or of the insured, as the case may be, duly authorized for the purpose, that he has so sent such notice addressed as aforesaid shall be prima facie evidence on the sending thereof as aforesaid. This section shall apply to the legal representatives, trustee in bankruptcy, receiver, assignee, trustee and the successor in interest of any such Contractor.

The aforesaid insurance shall be taken out and maintained at the Contractor's own expense.

2. Traffic Officers.

The Contractor shall take out and maintain at his own expense, insurance against damages arising from injury to special uniformed police, referred to in Article 58, while they are engaged in the performance of their duties. The coverage and provisions of such insurance shall be similar to those required to insure employees of the Contractor under the Workmen's Compensation Act, and shall be in addition thereto.

The aforesaid insurance shall be taken out and maintained at the Contractor's own expense.

3. Contractor's Public Liability and Property Damage Liability Insurance.

The Contractor shall furnish evidence to the Board that, with respect to the operations he performs, he carries Contractor's Public Liability Insurance providing for a limit of not less than a monetary value specified in the Special Provisions for all damages arising out of bodily injuries to or death of one person, and, subject to that limit for each person, a total limit of a monetary value specified in the Special Provisions for all damages arising out of bodily injuries to or death of two or more persons in any one accident, and Contractor's Property Damage Liability Insurance providing for a limit of not less than a monetary value specified in the Special Provisions for all damages arising out of injury to or destruction of property in any one accident and, subject to that limit per accident, a total (or aggregate) limit of a monetary value specified in the Special Provisions for all damages arising out of injury to or destruction of property during the policy period.

If any part of the work is sublet similar insurance shall be provided by or in behalf of the subcontractors to cover their operations.

Such property damage and public liability insurance as are provided under this Contract must cover all the various types and items of work that are to be undertaken. For the purposes of this Contract the insurance shall be considered to be in full effect from the date of signing of the Contract to the date of the final acceptance of the work.

lodge, board and trade where and with whom he elects, and neither the Contractor nor his agents or employees shall directly or indirectly require as a condition of employment therein that an employee shall lodge, board or trade at a particular place or with a particular person. Attention of bidders is called to Section 148 of Chapter 149 of the General Laws, and acts in amendment thereof which require the weekly payment of employees.

Article 47. Permits and Licenses.

The Contractor shall procure at his own expense all permits and licenses, pay all charges and fees and give all notices necessary and due in connection with the lawful prosecution of the work.

Article 48. Patented Devices, Materials and Processes.

Whenever the Contractor desires to use any design, device, material, or process covered by letters patent or copyright, the right for such use shall be secured by suitable legal agreement with the patentee or owner, and a copy of this agreement shall be filed with the Owner.

Article 49. Sanitary Provisions.

The Contractor shall provide and maintain in a neat and sanitary condition such accommodations for the use of his employees as may be necessary to comply with the requirements of the Department of Public Health, local health officials or of other authorities having jurisdiction.

Article 50. Public Safety and Convenience.

The Contractor shall be responsible for the maintenance of traffic over, through or around the work included in his contract with the maximum of safety and practicable convenience to such traffic during the life of the contract, and whether or not work thereon has been suspended temporarily. He shall take all precautions for preventing injuries to persons or damage to property in or about the work. If the Contractor constructs temporary bridges or provides temporary crossings of streams, his responsibility for accidents shall include the roadway approaches as well as the structures of such crossings.

The work shall be carried on in such a manner as to provide safe passage at all times for public travel and with least obstruction to traffic. The convenience of the general public and of residents along and adjacent to the project shall be provided for in an adequate and satisfactory manner. The Contractor shall provide and maintain at his own expense (except as otherwise provided herein) in a safe and passable condition, such temporary by-passes and temporary bridges as may be necessary to accommodate traffic on and around the construction; and he shall provide and maintain, in a safe condition, temporary approaches to and crossings of intersecting highways.

Roads shall be closed to travel only as directed by the Engineer. Where the new construction coincides with the present traveled way, the Contractor shall so carry on his work that travel will not be obstructed.

his operations to avoid injury to underground structures such as water or gas mains, pipes, conduits, manholes, catch basins, etc. When necessary, the Contractor shall cooperate with representatives of public service companies in order to avoid damage to their structures by furnishing and/or erecting suitable supports, props, shoring or other means of protection.

Fire hydrants adjacent to the work at all times shall be readily accessible to fire apparatus and no material or other obstructions shall be placed within a radius of ten (10) feet of a fire hydrant.

Land monuments and property marks shall be carefully protected and if necessary to remove the same, he shall do so only at the Engineer's direction and after an authorized agent has witnessed or otherwise referenced their location. The Contractor shall not injure or remove trees or shrubs without proper authority. Insofar as possible the Contractor shall confine his movements and operations to the area within the limits of the location and the area outside the scope of the work shall not be disturbed except as directed.

Article 53. Responsibility for Damage Claims.

The Contractor shall take all responsibility for the work and take all precautions for preventing injuries to persons and property in or about the work; shall bear all losses resulting to him on account of the amount or character of the work, or on account of the weather elements or other causes, and the Contractor shall indemnify and save harmless the Owner and all of its officers, agents and employees against all suits, claims or liability of every name and nature, arising out of or in consequence of any acts of omission or neglect of the Contractor in the performance of the work covered by the contract and/or failure to comply with the terms and conditions of said contract, whether by himself or his employees or sub-contractors.

Damage to materials furnished by the Owner or damage to the Owner's property, either now existing or constructed under this Contract, and all loss or deterioration occurring prior to the final acceptance of the work, and resulting from the Contractor's operations, shall be made good by the Contractor at no expense to the Owner.

Article 54. Contractor's Responsibility for the Work.

Until its final approval by the Owner, the Contractor shall assume full charge and care of the work and he shall take every necessary precaution against injury or damage to the work by action of the elements, or from any cause whatsoever, whether arising from the execution or the non-execution of the contract. The Contractor shall bear all losses resulting to him on account of the amount or the character of the work, or because the nature of the land in or on which the work is done is different from what was estimated or expected, or on account of the weather elements, or other causes.

The Contractor shall rebuild, repair, restore and make good at his own expense, all injuries or damages to any portion of the work occasioned by any of the above causes before the completion of the work and the accep-

the Owner may, at its discretion, pay the same, and the Contractor shall repay to the Owner all sums so paid. The Owner may also, with the written consent of the Contractor, use any moneys retained, due or to become due under the contract, for the purpose of paying for labor and materials and for the rental of appliances and equipment for the work for which claims have not been filed as specified above. It is understood that the security required by Section 29 of Chapter 149 of the General Laws, Tercentenary Edition, is obtained both by the bond accompanying the contract and by the power of the Owner to retain and pay money under the provisions of this article, but the release of one shall in no way impair or discharge the other.

Article 56. No Waiver of Legal Rights.

Neither the inspection by the Owner nor any of its employees or agents, nor any order, measurement or certificate by the Engineer, nor any order by the Owner for the payment of money, nor any payment for, or acceptance of, the whole or any part of the work by the Engineer or Owner, nor any extension of time, nor any possession taken by the Owner or its employees, shall operate as a waiver of any provision of the contract, or of any power herein reserved to the Owner or any right to damages herein provided; nor shall any waiver or any breach of the contract be held to be a waiver of any other or subsequent breach. Any remedy provided in the contract shall be taken and construed as cumulative, that is, in addition to each and every other remedy, herein provided; and the Owner shall also be entitled as of right to a writ of injunction against any breach of any of the provisions of the contract.

Article 57. Use of Explosives.

When the use of explosives is necessary for the prosecution of the work, the Contractor shall observe the utmost care not to endanger life and property, and whenever directed, the number and size of the charges shall be reduced. All explosives shall be stored in a secure manner and all such storage places shall be marked clearly "DANGEROUS - EXPLOSIVES," and shall be in the care of competent watchmen at all times. The method of storage and handling explosives and highly inflammable materials shall conform with all the State laws and regulations, as well as any local requirements.

Prior to blasting, the Contractor shall serve reasonable notice thereof to the operating official or company, or companies, leasing or owning pipes, conduits, poles, wires, etc., in danger of being injured by the blasting in order that a representative of said owner or lessees may be present at the site, and he shall take proper precaution to prevent such injury by the use of sufficient dunnage.

No blasting shall be attempted until sufficient warning has been given to all persons in the vicinity of the work.

The cost of additional bond or insurance, if any, required by the Owner and/or his agents, or by other duly authorized officials, shall be borne by the Contractor. No extra compensation will be paid the Contractor for the additional risk involved in blasting, for the additional cost of the extreme precautions required for safe blasting or for the additional cost of bonds or insurance required.

Article 58. Traffic Officers and Flagmen.

When in the opinion of the Owner it is necessary that special uni-

The Contractor shall comply with the provisions of Section 179A of Chapter 149 of the General Laws, relative to giving such preference to citizens in awarding contracts for public work as is therein provided.

Article 61. Schedule of Operations.

Before commencing work, the Contractor shall, if required, submit a schedule of operations for approval by the Engineer. The schedule shall show the methods and order of operations that the Contractor proposes to use. The approval of the schedule by the Engineer shall not be construed as relieving the Contractor from any responsibility.

Article 62. Prosecution of Work.

The Contractor shall commence work within seven (7) calendar days after the execution of the contract, or within such other period as the Engineer shall authorize in writing, (approved by the Owner) at such points as the Engineer may direct, and he shall thereafter prosecute the work at such points and in such order as the Engineer may from time to time prescribe.

Should the prosecution of the work for any reason be discontinued, the Contractor shall notify the Engineer at least twenty-four (24) hours in advance of resuming operations.

It is the purpose of the Owner to complete the work in the shortest time possible and consistent with approved construction. To this end, Contractors will be required to use improved methods and equipment for doing the work and various parts thereof. All equipment shall be complete and well designed, and the organization shall be efficient and effective.

If, in the opinion of the Engineer, it is necessary at any time, the Contractor shall, when directed, employ such forces and equipment for one or more additional shifts as will be required to insure the proper completion of the work. The Contractor shall provide and maintain, including power or fuel, sufficient lights for the safety of his construction forces and to ensure the proper construction, inspection and prosecution of the work; in addition to any lights necessary to protect the work or the public. The Contractor shall not receive any compensation therefor in addition to the contract unit prices.

The Contractor shall work diligently and steadily on the work, and when ordered in writing by the Engineer to either begin work again or to increase personnel and equipment on the work to speed up progress, the Contractor fails so to do within 5 calendar days, the Contractor shall be considered to have abandoned the job and the Bonding Company shall be notified to complete the work or forces and equipment shall be engaged by the owner to complete the work as per conditions herein.

Article 63. Delay in Commencing Work.

The Owner may delay the commencing of the work, or any part thereof, if the Owner shall deem it best for its interests to do so. The Contractor shall have no claim for damages on account of such delay, but shall be entitled to an equivalent extension of time in which to complete the whole

The Engineer is to constitute an adjudicator in regard to this Article of the Contract. He is to determine the cost or loss suffered by the Owner as a result of the delay in completion of the work.

Whatever the sum of money may become due and payable to the Owner by the Contractor under this article may be retained out of money belonging to the Contractor in the hands and possession of the Owner; and it is agreed that this article is to be construed and treated both by the parties to the contract and by all courts of law or equity, not as imposing a penalty upon said Contractor for failing fully to complete said work as agreed on or before the time specified in the Proposal, but as liquidated damages to compensate said Owner for all damages actually suffered because of the failure of the Contractor fully to complete said work on or before the date of completion specified in the Proposal.

Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in nowise operate as a waiver on the part of the Owner of any of its rights under the contract.

Article 68. Annulment of Contract.

If the Contractor shall be adjudged a bankrupt, or if he shall make a general assignment for the benefit of his creditors, or if a receiver of his property shall be appointed, or if the work to be done under the contract shall be abandoned, or if the contract or any part thereof shall be sublet without the previous written consent of the Owner, or if the contract or any claim thereunder shall be assigned by the Contractor otherwise than as herein specified, or if at any time the Engineer shall be of the opinion, and shall so certify in writing to the Owner that the work, or any part thereof, is unnecessarily or unreasonably delayed, or that the Contractor has violated any of the provisions of the contract, the Owner may notify the Contractor to discontinue all work, or any part thereof; and thereupon the Contractor shall discontinue such work, or such part thereof as the Owner may designate, and the Owner may thereupon, by contract or otherwise, as it may determine, complete the work, or such part thereof, and charge the entire expense of so completing the work or part thereof to the Contractor; and for such completion the Owner for itself or its agents may take possession of and use or cause to be used in the completion of the work or part thereof of any such materials, animals, machinery, implements and tools of every description as may be found upon the line of said work. The Owner shall not be liable for any depreciation, loss or damage to said materials, animals, machinery, implements or tools during said use, nor until removed by the Contractor after completion of the work. Unless so removed within fifteen (15) days after mailing of notice so to do, they may be sold at public auction, after publication of notice thereof at least twice in any newspaper published in the City or Town, and the proceeds credited to the Contractor's expense subject to a lien for the storage charges.

If the engineer shall certify that the rate of progress is not satisfactory the Owner may, instead of notifying the Contractor to discontinue all work or any part thereof, notify him from time to time to increase the force, equipment and plant, or any of them, employed on the whole or any part of the work, stating the amount of increase required; and unless he shall within five (5) calendar days after any such notice, increase his force, equipment and plant to the extent required therein, and maintain and

tered during the prosecution of the work and until its final acceptance by the Owner, and for all risks of every description connected with the prosecution of the work, also for all expenses incurred by, or in consequence of the suspension or discontinuance or the said prosecution of the work as herein specified, and for any infringement of patent, trade-mark or copyright, and for completing the work in an acceptable manner according to the plans and specifications.

The payment of any current estimate, or of any retained percentage shall in no way constitute an acknowledgement of the acceptance of the work or in no way or degree prejudice or affect the obligation of the Contractor, at his own cost and expense, to repair, correct, renew or replace any defects and imperfections in the construction of, or in the strength of, or quality of materials used in or about the construction of the work under contract and its appurtenances, as well as all damages due or attributable to such defects; which defects, imperfections or damages shall have been discovered on or before the final inspection and acceptance of the work. The Engineer shall be the sole judge of such defects, imperfections, or damages and the Contractor shall be liable to the Owner for failure to correct the same as provided herein.

Article 71. Payment for Increased or Decreased Quantities.

An increase in quantities of work to be performed (as set forth in Articles 3, 22 and 23) will be paid for at the contract unit price for the actual work done, in the same manner as if such work had been included in the original estimated quantities. No allowance will be made for anticipated profits or underruns in quantities.

Changes involving extra work will be paid for according to the method stipulated in the extra work orders.

Article 72. Omitted Items.

The Engineer may order omitted from the work any items or portions of the work found unnecessary to the improvement and such omission shall not operate as a waiver of any condition of the contract nor invalidate any of the provisions thereof, nor shall the Contractor have any claim for anticipated profit.

Article 73. Payment for Extra Work.

Extra work will be paid for in accordance with the accepted and approved extra work orders according to procedures outlined in Articles 22 and 23.

The determination of the Engineer shall be final upon all questions pertaining to the amount and value of extra work performed.

In making any change contemplated, the charge or credit for the change shall be determined by the Owner in one of the following methods prior to the issuance of the order for the changed work:

balance not retained as aforesaid, after deducting therefrom all previous payments and all sums to be kept or retained under the provision of this contract.

No such estimate or payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the contract, or when in his judgment the total value of the work done since the last estimate amounts to less than three hundred (300) dollars.

The Owner may, if it deems it expedient so to do, cause estimates to be made more frequently than once in each month, and it may cause payments to be made more frequently to the Contractor. The Owner may at its option retain, temporarily or permanently, a smaller amount than as aforesaid, and may cause the Contractor to be paid, temporarily or permanently, from time to time such portions of the reserves as it deems prudent.

The Owner may also allow partial payment on such materials and/or items delivered on the site of the work but not considered as erected or complete in place (for which the ordinary payment as specified above would place) but for which, in the judgment and opinion of the Engineer, the Contractor shall be allowed a partial compensation, due to the fact that the scheduled completion of such materials and items has been hindered and delayed by either temporary closing of the project or by such other causes over which the Contractor has no control. The amount of such partial payments will be determined by the Engineer but in no case shall it exceed seventy per cent (70%) of the contract unit price.

The Owner may increase the retained percentage as security for claims or costs incurred under Articles 55, 62, 67 and 68 or any other section of the Contract.

Article 75. Acceptance and Final Payment.

The Engineer shall, as soon as practicable after the satisfactory completion of the contract, make a final estimate of the amount of work done thereunder and the value of such work, and the Owner shall, within sixty-five (65) days from and after the day the work has been approved by the Owner, forward to the Contractor a copy of the final estimate together with an agreement form for his acceptance. After such acceptance has been filed with the Owner payment of the entire sum will be made, so found to be due thereunder after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the contract. All prior estimates and payments shall be subject to correction in the final estimate and payment.

**SPECIAL
PROVISIONS**



**HAMPDEN COUNTY
APPROVED**

SEP 12 1956

William J. Harrison
Thomas F. Sullivan
Ralph S. Walsh
County Commissioners

**TIGHE & BOND
CONSULTING ENGINEERS
HOLYOKE, MASS.**

SPECIAL PROVISIONS

Article 76 Scope of the Work General plans, elevations, and details of the proposed work on 23 sheets of plans entitled:

RECONSTRUCTION OF FLOOD DAMAGE
AT
BEAR HOLE DAM
BOARD OF WATER COMMISSIONERS
TOWN OF WEST SPRINGFIELD, MASS.

Tighe & Bond, Consulting Engineers
Holyoke, Mass.

Scale as shown May, 1956

Further details of the work and the various items and proposals included in the work are found in the specifications, under Standard details, and in addenda; all of which are hereby made a part of the Contract Document.

The Contractor will furnish all plant, labor, equipment and materials necessary for or incidental to the work contemplated under this Contract. The work consists of clearing the site, excavation, concrete work, earth work, final grading, pipeline work, and all other work required for or incidental to the construction of a water supply storage dam, as shown on the plans.

Article 77 Proposal Guarantee Each proposal from a Contractor must be accompanied by cash or certified check in the amount of \$7,500.00. Such certified check shall be drawn upon a National Bank or Trust Company and shall be made out to the Town of West Springfield, c/o the Board of Water Commissioners, Town of West Springfield, Mass. (reference Articles 7, 16 and 19)

Article 78 Contract Bond A bond in the full amount of the contract with a surety company satisfactory to the owner will be required by the Town from the General Contractor for the faithful performance and full payment of all work required for labor and materials furnished under this contract.

Quadruplicate copies of all bonds and certificates are to be furnished to the Board of Water Commissioners, Town Hall, West Springfield, Mass.

Article 79 Insurance Requirements In accordance with Article 44 of the General Requirements, the Contractor is to furnish the following insurance:

Public Liability	\$100,000 - \$300,000
Property Damage	\$50,000 - \$100,000

The Contractor is warned to read carefully and to have his insurance company read carefully the provisions of Article 44.

The insurance certificate must include provision for that portion of Article 44, Page 18, of the General Requirements which reads:

"assume the defense of and indemnify and save harmless the Owner, together with his officers, employees and agents, from all suits, loss, cost or damage arising out of or attributable to claims related to the project".

The Contractor will be required to furnish a copy of the complete insurance contract, including all riders. This insurance contract must show that the insurance provided covers all phases of the work and all activities of the Contractor on this project.

The Contractor and his bonding company are warned that in the event they elect to furnish separate performance and payment bonds, each of the two bonds are to be furnished in the full amount of the contract.

Article 80 Special Conditions The Contractor's attention is directed to the following special conditions affecting the progress and scheduling of work under this contract.

- A. In making an award, the Owner will not only consider the unit prices and total value of the contract but also reserves the right to consider the proposed construction time as stated by the Contractor in his proposal form. The Owner reserves the right to make an award to a bidder other than the lowest responsible bidder based on the total bid price. In the latter case, the Owner will balance probable increased cost against the shorter construction time in order to determine the possible benefit to the Town.

The Owner also reserves the right to consider the advantage to the Town in making an award of both the dam and the filter plant to one Contractor.

- B. Contractor is to inspect the material furnished by the Town at the time of the signing of the contract and all damage and shortages are to be noted. Hereafter the Contractor is to be responsible for these materials and any loss or damage is to be made good by the Contractor at no expense to the Owner.
- C. The Contractor is warned that his work must be coordinated with the construction activities of the contractors on the filter plant. At all times the Contractor on the filter plant must be allowed reasonable access to the filter plant area.

The Contractor at the filter plant will be required under his contract to provide for the use of the existing roadway and bridge upstream of the #1 Filter. The existing bridge is to be maintained until such time as it is no longer of value to the dam contract. At that time the dam Contractor will be responsible for its removal under Item 1 of his contract.

- D. The Contractor will be supplied water for construction purposes

from existing and proposed hydrants within the work area. The Contractor will pay standard rates and follow standard Water Department procedure in order to obtain this water. The Contractor will then be reimbursed in subsequent payments for the full amount of his payment for water to the Water Dept. Thus, the cost of water will be nothing but a bookkeeping item for the Contractor.

- E. Access Rd. #2 will be maintained in a usable condition by the Contractor using material furnished and placed under the provisions of Item 14. The Contractor is required to do all scraping and blading to maintain the road's contour and to provide for free drainage.

Article 81 Materials Furnished by The Owner The owner will furnish the following materials:

1. All pipeline material required for construction of the 24" Lock Joint Pipeline from the dam to and including the point of closure.
2. All material required for the 5 sluice gates shown on the plans. This is to include the gates themselves, stems and stem guides, floor stands, wall castings and thimbles, and anchor bolts. All materials furnished by the owner are assumed to be in first class condition ready for use.

Materials should be inspected by the contractor at the time of signing of the contract. Any shortages or damages that occur to these materials after the signing of the contract will be the Contractor's responsibility.

Prior to installation, the Contractor should again carefully inspect these materials. The Owner will not be responsible for the failure of any material furnished except that the piece of material will be replaced by the Owner if failure results from causes not the fault of the Contractor. The cost of removing the damaged piece and the installation of the replacement will be for the Contractor's account.

Article 82 Engineering Services The Owner will furnish the General Contractor with the required benchmarks and reference points for the construction of the dam. All engineering and survey work required to work from these benchmarks and reference points to the completed dam are to be furnished by the Contractor and the cost thereof included in his proposal.

The Owner reserves the right to do such engineering and survey work as he may deem necessary to review the work of the General Contractor, to determine pay quantities and for such other reasons as the Owner may deem necessary.

Article 83 Liquidated Damages The Contractor's attention is directed to the provisions of Article 57 of the General Require-

ments of this contract and to the provisions of Article 80 of the Special Provisions of this contract. For the purposes of these articles, completion is hereby defined as the time when all work is completed and the dam ready to impound water. The only thing not included within this completion time is the minor clean-up work and landscaping that may be required at the end of the job.

The for purposes of this Contract, the sum of money referred to in paragraph 2 of Article 67 is hereby defined by the Owner as \$50.00 per calendar day that the job shall remain substantially uncompleted beyond the time specified in the Contractor's proposal. This figure will also be applied in the event the Owner elects to compare bids on the basis of construction time.

ITEM 1

PREPARATION OF THE SITE

Article 84A Work Included Under this item, the Contractor is to do all work required to prepare the site for construction, to control and divert the brook, to clean up the old dam site, and to do all other work not especially provided for under the items of this contract but required for or incidental to the construction of the dam.

Article 84B Old Dam Site At the old dam site upstream of the proposed dam to be constructed under this contract, an old wooden dam has been exposed in the breach. The General Contractor under this item is required to clean out these old timbers insofar as is possible. The timbers are to be either pulled out using a crane or are to be cut off within 6" of existing ground.

The Contractor under this item is to remove the damaged sluice gate from the existing spillway. The anchor bolts are to be burned off, flush with the face of the concrete and the sluice gate, stem and guides, and the floor stand are to be removed and disposed of. The Contractor is also to remove the damaged wooden flashboards and spillway bridge from the existing spillway.

No work on the existing spillway concrete structure or on the remaining portions of the earthen dam is contemplated under this item.

Article 84C Bridge The existing concrete bridge over the brook bed located downstream of the proposed dam site is to be retained as long as possible for use by the Contractors working in the area. When deemed necessary by the Dam Contractor and approved by the Engineer, this bridge is to be removed. Removal of the concrete portions of the bridge will be paid for under Item No. 4. The removal of earth involved will be paid for under Item No. 3. The masonry from this bridge may be disposed of by burying in the plateau downstream of the proposed dam between lines 6+00 and 7+00.

Article 84D Water Control Under this item, the General Contractor is to do all necessary work required for the control and diversion of water in the construction area.

In the construction of the dam itself, the plans show the construction of two cofferdams. These cofferdams are required in order to divert the brook through the new spillway and spillway channel. These cofferdams will be constructed by excavating a trench under water and placing impervious material under water insofar as is possible. Upon the completion of these cofferdams, the brook will be diverted through the new spillway and spillway channel. The area between the cofferdams will then be dewatered and that section of the dam will be placed upon existing impervious soil "in the dry".

The Contractor will be required to take certain construction steps for the control of storm water runoff from the sidehill during the construction period. This work will generally consist of the construction and maintenance of ditches to divert this runoff downstream of the dam and prevent the scour of newly placed fill from storm water runoff from the sidehill.

The ground water table in the easterly embankment of the dam is held at approximately the elevation 180 by a layer of impervious material. This conditions results in springs in the easterly abutment. If the construction of the dam exposes any springs which are deemed harmful to the construction of and future safety of the dam, the Engineer will order additional work for the control of these springs. In general, this additional work will consist of the installation of drainage provisions under the applicable items to lead these springs away from the dam site.

Article 84E Engineer's Facilities The Contractor will be required to provide a weathertight building containing approximately 100 sq. ft. of floor space to be used by the Engineer. Windows and doors with suitable locking devices and screens are to be provided. Electricity and heat are to be provided as required by the Engineer.

The Contractor is to arrange for an extension of the telephone to be installed in the Engineer's building at the filter plant site for use at the dam site.

The Engineer's building is to be provided with a built-in plan table having a smooth top constructed of masonite or similar material. Two chairs are to be provided.

The cost of constructing and maintaining this building, including utilities, is to be borne by the General Contractor.

Article 84F Photographs The Contractor is to provide six prints of each of 15 different photographs taken on the job as it progresses. Photographs are generally to be taken in groups of three at a time. The prints are to be approximately 8x10 and a glossy, the type normally taken for newspaper work. The cost of these photographs is to be included by the General Contractor in his proposal under this item.

Article 84G Signs The Contractor is to furnish and install two signs, lettered as shown on the Standard Detail attached to the rear of these specifications. In general, the signs will have one line of 6" high letters, a second line of 6" high letters and two lines of 2½" high letters.

One sign is to be installed by the Contractor at the old dam site. The second sign is to be installed by the Contractor at the spillway at the new dam site. Both signs are to be installed as directed by the Engineer.

Article 84 Payment The Contractor will receive payment under Item No. 1 as specified in his proposal for all work described hereinabove. The Contractor will be paid on a monthly basis for the work specified and the amount received each month will be equal to the total bid price under Item No. 1 provided by the Contractor's estimated construction time in months.

ITEM 2

CLEARING AND GRUBBING

Article 85A Work Included Under this item, the Contractor will do all clearing and grubbing required for the construction of the dam, the operation of the specified borrow pit, clearing of the reservoir area as far as the water level and all other cleaning and grubbing required for the prosecution of the job.

Article 85B Work Area Under this item, the Contractor will be required to clear the easterly sidehill between the old dam site and the existing cleared area at the new dam site. This area is to be cleared to elevation 170.

The westerly sidehill is to be cleared of all vegetation existing between the old dam site and the new dam site. Only the vegetation below elevation 170 is to be removed under this contract.

All borrow areas in the westerly sidehill used for impervious material are to be cleared and grubbed under this item of the Contract.

The dam site and borrow pit for pervious material have been cleared under a previous contract. It is assumed that this clearing is sufficient for the construction requirements. However, in the event that it is necessary to do additional clearing for either the pervious borrow pit or for the construction of the dam itself, the Engineer will authorize such further clearing under the provisions of Item 2 of the Contract.

Article 85C Construction Methods All trees, brush and other vegetation is to be cut and burned or removed from the job site. All organic debris is to be removed and disposed of. An existing dump at the top of the hill on Access Road #1 can be used for the disposal of stumps, partially burned trees, and other organic debris. No organic debris is to be buried in the plateau downstream of the proposed dam.

All areas to be stripped and grubbed under this item are to have all vegetation, leaf mold and organic material removed from the surface. This material is to be bulldozed together into piles and stockpiled for use in covering the plateau area downstream of the proposed dam. It is assumed that Excavation under Item 3 will be required after completion of grubbing in order to prepare the ground surface for placement of earth fill.

The Contractor is to have proper permits for any open fires and proper equipment to control these open fires. No open fires are to be allowed without the approval of the Superintendent of the Water Dept. and the Town of West Springfield Fire Chief.

Article 85D Payment The Contractor will receive payment at the unit price specified in his proposal for each acre of area cleared and grubbed and stripped in accordance with the specifications. The Contractor's unit price will include all labor, equipment and materials required for or incidental to the clearing operation. It is to include the stockpiling of all surface material, leaf mold, and other organic material and its subsequent spreading on the plateau downstream of the dam. It is also to include the disposal of all partially burned material and stumps at the specified dump on Access Rd. #1.

ITEMS 3 & 4

EXCAVATION

Article 86A Work Included Under Item #3, the General Contractor is to do all earth excavation required for or incidental to the construction of the dam. This is to include excavation for the spillway, excavation and removal of any unsatisfactory material within the area on which the dam is to be built, excavation for the cofferdams shown on the plans and all other excavation required for or incidental to the construction of the dam.

Under Item 4 the Contractor will be required to do all rock excavation required for the construction of the spillway and spillway channel and all other rock excavation required for or incidental to the job.

It is assumed that the borrow pits operated on the westerly sidehill to obtain impervious material will expose ledge. In the event that the Contractor elects to operate a quarry at these locations for the purposes of obtaining riprap for use under Item 16, the Contractor will receive payment for rock removed and placed as riprap under the provisions of Item 16. The Contractor will not receive any payment under Item 4 for rock excavated solely for the purpose of obtaining riprap for use under Item 16.

Article 86B Construction Methods The General Contractor will be required to excavate for the spillway in accordance with the lines and grade shown on the plans. Where shown on the plans, earth is to be left in its existing location and in undisturbed condition.

Of those sections of the spillway and culvert that are to be carried down to ledge, the Contractor will be paid under Item 3 for all earth removed within the two supports for the culvert and spillway and will be paid under the Impervious Fill Items for material replaced after the construction of the footings and walls.

The General Contractor will be required to construct the cofferdams shown on the plans in order to divert the brook thru the new spillway and spillway channel. This excavation work for the cofferdams will be done under water to some extent, and the placement of impervious or semi-pervious fill for the cofferdams will be done under water. All earth removed for construction of the dam and its cofferdams is to be disposed of in the plateau downstream of the dam.

Paylines for earth excavation for structures are to extend from the bottom of the concrete or from the rock line to the surface of the ground. The paylines are to be one foot outside the limit of neat concrete lines and are to extend vertically from the bottom of excavation or the top of ledge to the ground surface. In the

case of excavation for the cofferdams and spillway channel, the Contractor will be paid for the amount of excavation shown on the plans or required by the Engineer in the field.

Article 85C Rock Excavation Under this Item 4, the General Contractor will do all rock excavation required for the construction of the spillway, spillway channel and other work incidental to the construction of the dam.

Under Item 4, the General Contractor will receive payment for the volume of concrete involved in the removal of the existing bridge across the brook downstream of the proposed dam site.

Rock is to be removed from the construction of the spillway to the lines and grades shown on the plans. In general, the lines and grades shown on the plans are the minimum acceptable lines and grades. In the event that sound rock is not encountered at the surface of the ledge, the contractor will be required to excavate into the ledge such distance as determined by the Engineer to be required in order to obtain sound rock as foundation material for the spillway and culvert section. In no case will the Contractor be allowed to excavate less ledge than is shown on the plans as being required for the construction of the footing and spillway walls.

All rock excavated under Item 4 is to be disposed of as riprap on the upstream face of the dam. This rock will replace an equivalent amount of riprap under Item 16. No payment for rock excavated under Item 4 will be made under Item 16, regardless of the fact that it is being placed as rock fill and riprap.

The Contractor will be paid for rock removed under this item to the required paylines as shown on the plans and as specified by the Engineer at the time of construction. The minimum removal of rock is shown on the plan. The Contractor will be paid for all rock removed providing it is within 2 ft. horizontally of the surface of the concrete. Thus, the Contractor has an overbreak allowance of 2 ft. horizontally. The Contractor will not be allowed to remove any ledge below the limits of the bottom of concrete to be placed and any ledge so removed is to be replaced with concrete at the Contractor's expense.

All necessary precautions shall be taken in blasting operations to preserve the rock outside the lines of excavation in the soundest possible condition and at the same time to produce a mass of blasted rock that will be suitable for use in the permanent work. To accomplish this the Contractor shall determine the spacing of the drill holes across the open cuts, and also regulate the amount and strength of explosives, so that in the outer portions of the cut, suitable large pieces will be produced for use as dumped rock and the wall rock will be protected from shattering.

Blasting, in proximity to the rock foundations of concrete structures, shall be conducted with such amount and strength of explosives as will break the rock approximately to the lines and grades desired and yet will leave the rock in an unshattered condition. Preparation of the final foundations of these structures shall be done by drilling, picking, barring, wedging or similar methods. Where required by the Engineer, the rock at the site of the structures shall be cut rough steps or benches to provide better bond and bearing surfaces. To aid inspection at locations and to insure good bond with the concrete, the foundation shall be thoroughly cleaned by streams of water or jets of air or a combination of both, or by wet sand-blasting as required by the Engineer.

If the Contractor's removal of ledge is within 6" of the required concrete line, concrete will be poured against existing ledge and the Contractor shall receive payment for the full quantity of concrete. If the ledge removed has an overbreak of more than 6" from the neat lines of the concrete, the Contractor will be required to erect forms in order to confine the amount of concrete that is placed.

Article 86B Existing pipelines There are two existing pipelines which pass through the proposed dam area and which must be removed within the limits of the dam construction. One pipeline is a 12" cast iron pipeline located on the west side of the brook and immediately east of the existing Access Road. This pipeline is in the approximate location of the new spillway and it is assumed that it will be removed along with excavation for the spillway. No special pay item is provided for the removal of the pipeline. However, in the event that the pipeline is not fully removed during excavation for the spillway, the Contractor will be paid additional excavation required for the complete removal of the pipeline.

A second pipeline is located at the toe of the easterly sidehill. The exact size, location and depth of this pipeline is unknown. The General Contractor will be paid under Item 3 to do the required excavation to expose and remove this pipeline within the limits of the dam site.

Article 86E Unauthorized Excavation The Contractor will not be paid for any excavation outside the specified paylines and not definitely authorized by the Engineer in writing. In the event that such unauthorized excavation is carried out underneath a structure or pipeline, the Contractor will be required to replace the disturbed material with material satisfactory to the Engineer. In general, in the case of the spillway culvert that is to be founded on hardpan, any unauthorized excavation will be replaced with concrete.

The Contractor is hereby warned that the downstream section of the

spillway culvert is to be located on undisturbed hardpan. The Contractor will be allowed to use machine operation methods of excavation providing no material is disturbed below the level of the bottom of the concrete. Upon completion of machine operation, all loose or disturbed earth is to be removed using hand methods. The bottom of excavation is to be leveled up as necessary and concrete is to be poured directly against the hardpan.

Article 86F Payment The General Contractor will be paid the unit price specified in this proposal for each cubic yard of excavation completed in accordance with the requirements of this contract. Paylines for earth excavation are to be 1 Ft. horizontally outside the limit of concrete placement in the case of structures and the inside diameter of the pipeline plus 24 inches in the case of pipelines. The vertical dimension for paylines for earth excavation will extend from the bottom of concrete to be placed to the top or surface of the existing ground level. In cases where ledge is encountered, the payline for earth excavation will extend from the surface of the ledge to existing ground level.

The paylines for rock excavation under Item 4 are to extend from the bottom of concrete to the top of the ledge removed. The ledge will be paid for to the actual removal lines providing that the overbreak does not extend more than 2 ft. horizontally from the base of the concrete. In no case will ledge be paid for which has been removed more than 2 ft. away from the proposed neat concrete line.

Only ledge requiring removal by blasting or drilling will be paid for under Item 4. All shaley or laminated material removed with a backhoe or bulldozer, and all rotten stone or hardpan that can be removed by normal excavation methods or by pick and shovel will not be paid for under Item 4.

The Contractor's prices under Items 3 and 4 are to include all necessary handling and re-handling of the material removed, including stockpiling material for future use if necessary. All rock excavation under Item 4 is to be disposed of on the upstream face of the dam and will replace riprap under Item 16. The Contractor will receive payment under Item 4 for rock excavation but will not receive any payment under Item 16 for the disposal of this rock excavation on the upstream face of the dam.

The Contractor will receive payment from the surface of the existing ground regardless of whether it is substantially altered between the time that work begins and the time that actual excavation takes place at a given area. In other words, if the Contractor places fill at a given location and then later is required to excavate thru the fill and thru existing native material in order to place a pipeline or structure, the Contractor will be paid only for the excavation from the original ground surface to the bottom of pipeline or structure so placed. The Contractor will be paid once and only once for excavation regardless of how many times a given piece of excavation falls within paylines for various structures and pipelines.

ITEM 5

CONCRETE

Article 87A Work Included Under this item, all concrete required for the Project will be furnished and placed by the Contractor. The only exception to this is insulating concrete to be furnished and placed under Item 7.

Article 87B General It is the intent of these specifications to secure, for every part of the work, concrete of homogeneous structure which, when hardened, will have the required strength and resistance to weathering and disintegration. To this end, the requirements herein-after specified must be met. Standard tests of the cement, aggregates, concrete and reinforcement will be conducted by the Engineer. The Contractor shall furnish the material for all required samples and labor as requested for obtaining samples. The Contractor agrees to accept as final the results of tests secured by testing laboratory engaged by Owner.

Article 87C Description Concrete furnished under Item 5 is to have a 30-day compressive strength of 2500 psi. It is to contain at least 5.6 bags of cement per cubic yard of concrete. Water is to be added in an amount not to exceed six (6) gallons per bag of cement so as to produce a slump of not more than 4-inches. Concrete

All concrete used under this Contract is to contain an air entraining agent used in accordance with the manufacturer's directions. The agent shall produce tiny, individual bubbles of air equal to 3%-6% by weight or volume of concrete. The cost of the air entrainment agent is to be included in Item 5

MATERIALS

Article 87D Portland Cement The Contractor shall furnish Portland Cement of the quality herein specified in sufficient quantity for the work required. All cement furnished for concrete in a given building shall be of the same type and color so as to avoid variations in the color of finished exposed concrete. Cement furnished shall be dry, free of lumps, and of a uniform blue-gray coloring. Cement shall meet the requirements of the A.S.T.M. Specifications C150-64, Type 2 or Type 3.

Article 87E Fine Aggregate The fine aggregate shall consist of sand composed of grains or particles of quartz or other hard and durable rocks, the surfaces of which are not coated with any foreign material nor worn smooth. The grains shall be moderately sharp, free from soft, decomposed or partly decomposed sand grains, lumps of clay or ferruginous cemented sand, mica, loam, sea salts, organic matter or other foreign materials. If the fine aggregate is washed it shall be allowed to stand at least twenty-four (24) hours in piles after washing before being used if so directed. The sand shall be well graded from coarse to fine and when tested by means of square mesh laboratory sieves shall meet the following requirements:

Passing 1/4" sieve - 100%
 Passing #10 sieve - 95% to 100%
 Passing #20 sieve - 30% to 75%
 Passing #50 sieve - 5% to 28%
 Passing #100 sieve - not more than 8%
 By elutriation test - not more than 3%

Article 87F Coarse Aggregate Coarse aggregate shall consist of crushed or screened stone gravel conforming to the following requirements: crushed stone or screened gravel shall consist of clean, hard, durable and impermeable particles, resistant to wear and frost and free from injurious amounts of organic matter, loam, clay, salt salts, mica and structurally weak particles. The particles shall be relatively round in shape and with gritty surfaces. Gravel shall be washed until the surfaces are clean and free of dust and surface coatings. In general, the use of gravel stone is preferred rather than crushed trap rock.

Article 87G Grading of Coarse Aggregate When tested by means of square mesh laboratory sieves, coarse aggregate shall meet the following requirements:

NOMINAL SIZE	PER CENT BY WEIGHT PASSING THROUGH			
1-1/2	1-1/2	3/4	3/8	#4
	95-100	30-60	5-20	0-5

Article 87H Water Water for use with cement shall be clean, clear and free from deleterious amounts of oil, acid, alkali, salts and organic matter. The water shall exhibit no deleterious effect upon the strength, setting or soundness of the cement.

Article 87I Forms Approved forms shall be provided and used by the Contractor. The forms shall be in good condition, clean and properly treated to give the concrete a smooth even finish. They shall be constructed of T&G lumber, plywood or composition facing and shall be sufficiently rigid so that they can be constructed and braced true to line and grade.

Forms shall be left in place until the concrete is sufficiently hardened and has attained a reasonable percentage of its final strength. Both before and after the form removal, proper attention must be paid to the moist curing of the concrete.

All form ties used are to be equipped with a ring welded or soldered to the tie rod near the center of the wall. This ring is to serve as a water stop.

The Engineer will require that the Contractor use ties that can be broken off within the wall and the resulting hole plugged with a grout containing an admixture to prevent shrinkage.

Article 87J Mixing. Mixer is to be of the batch type, having a rated capacity of at least one yard, and a gross volume at least twice its rated capacity. The mixer is to be charged dry and rotated for not less than 15 seconds. Water and admixtures are then to be added and the drum rotated for not less than 2 minutes for a 1-yard load plus 30 seconds for each additional yard in the load. Thus for a 5-yard load, a minimum mixing time of 4 minutes will be required. Under no circumstances is the mixing time to exceed four times the minimum mixing time nor exceed 15 minutes.

Article 87K Placing Concrete The forms shall be properly cleaned and wetted prior to the placing of concrete. All imbedded items are to be properly protected. All reinforcing is to be in proper condition and in the correct location. If the pour is to be made against existing concrete, the surface of the existing concrete shall be prepared as described in Article 87L.

Concrete shall be placed in a manner to prevent stone pockets, voids or segregation. Concrete shall not be dropped, flowed or dragged more than seven feet in the forms. Concrete shall be properly distributed and remixed in the forms with shovels, rods and vibration.

The Contractor will be allowed to use mechanical vibrators of a type and number approved by the Engineer. The use of the mechanical vibrators shall not eliminate the rodding of the concrete at the face of the forms.

In addition to steel reinforcement there will be built into, or set or attached to the concrete, pipes, anchors, or other metal objects as shown on the drawings or ordered. All necessary precautions shall be taken to prevent these objects from being displaced, broken or bent. Before placing concrete care shall be taken to determine that any embedded parts are firmly and securely fastened in place as indicated. They shall be clean and free of paint, rust, oil or any other coating or foreign matter. Concrete shall be packed tightly around pipes and other metal work so as to prevent leakage and secure perfect adhesion. Pipes shall be adequately protected from intrusion of concrete into them.

Article 87L Joints Only the construction joints called for on the plans will be allowed except on approval of the Engineer.

All horizontal construction joints are to be treated as follows: After pouring of the concrete and after initial set of the concrete has taken place, the construction joint is to be cleaned off with a jet of water or a jet of air and water mixed. The jet shall have sufficient force to clean off all loose concrete, scum and laitance. The jet shall expose and clean off aggregate but shall not undercut or loosen the aggregate.

Before pouring new concrete against concrete already in place and hardened, the surface shall again be cleaned with a water jet. The exposed aggregate shall then be mopped with a mortar composed of the same proportions of sand and cement as is in the concrete. The mortar shall be placed and mopped in place immediately prior to the placing of concrete and shall not have set up or hardened prior to the placing of concrete.

All construction and expansion joints are to be keyed. Two expansion joints allowed (one at junction of spillway section to culvert section; one at change in culvert from rock bearing to earth bearing) are to be formed with copper waterstop shown. All construction joints are to contain a 1/8" steel waterstop or 20 oz. water stop.

No vertical construction joints allowed at any location except at the two expansion joint locations and at junctions between the main spillway walls and the supporting diaphragm walls. Seepage rings to be poured integral with walls.

Article 87M Protection of Concrete and Curing The Contractor shall protect the concrete from damage by rain, sun, frost or underground water during and after placing, until properly cured and hardened in a manner satisfactory to the Engineer.

Cement is to be maintained at a temperature of not less than 50° F and not more than 100° F for a period of at least 7 days. During this period the concrete is to be kept properly covered and protected so as to maintain optimum moisture conditions.

Forms may be stripped at the end of 72 hours after pouring of concrete providing evaporation is retarded by the immediate placing of a waterproof film. This film is to be spray-applied as a liquid as the forms are stripped.

All methods of temperature and moisture control are to be subject to the approval of the Engineer. The Engineer reserves the right to vary these methods as necessary to produce the required results.

Article 87N Finishing Immediately after the removal of the forms, the work shall be inspected and defective work corrected. If the surface of the concrete is bulged, uneven, shows excessive voids, or has other markings which cannot be repaired satisfactorily, the entire section shall be removed as directed by the Engineer and replaced with with satisfactory work; all such removal and replacement work to be done at the expense of the Contractor. If the work is satisfactory, the minor repairs required are to be completed immediately and the required rubbing is to be done as soon as the concrete can be properly worked.

The Engineer shall be the sole judge of the satisfactory quality of the work completed. He shall determine as to whether the concrete is so poorly placed as to require removal or whether proper corrective work can result in a satisfactory job.

Concrete is to be finished as follows:

- (a) All exposed concrete is to be carefully rubbed and stoned so as to remove all fins, form marks and tie rod marks. Use of grout will not be required during the operation.
- (b) All other surfaces are to have rat-holes and form tie holes filled.

Article 87O Inspection The Engineer reserves the right to inspect the forms, reinforcing, etc., prior to the placing of concrete. The Contractor will be required to place one side of the wall forms and the reinforcing steel and shall give the Engineer reasonable notice to allow for inspection of the various features. Upon completion of forming and immediately before placing of concrete, the Engineer shall again be given reasonable notice to allow for final inspection. The Engineer will then give written approval for the placing of concrete for that portion of the work.

Article 87P Transit-mixed Concrete In the event that the Contractor uses a central batch plant for his operation, he will be required to meet the following conditions:

- (a) The batch plant is to be located in the Springfield-Holyoke-Westfield metropolitan area. It shall either be owned by the Contractor or have a background of five years' experience.
- (b) Trucks used are to be equipped with agitating-type bodies. Trucks shall arrive on the job with the mix dry. The provisions of Article 87J will apply in full.
- (c) Each truck arriving at the job is to have at least one copy of its "batch slip" and this copy is to be turned over to the Engineer. The batch slip is to quantity and class of concrete, the weights of cement and aggregate used and the time of departure from the batch plant. Also noted thereon is to be any admixture added at the batch plant.

Article 87Q Measurement Concrete quantities will be calculated based on the dimensions shown on the plans and such variations in these dimensions as may be approved by the engineer. In the event that concrete is placed to a smaller dimension than is shown on the plans and that such concrete is accepted by the Engineer, then the lesser dimension will be used to calculate the quantity. All major openings and pipes are to be deducted from the volume of concrete.

Article 87R Payment Payment will be made to the Contractor at the unit price specified in his Proposal for each cubic yard of cement furnished in place in the completed work in accordance with the Specifications. All concrete used will be paid for under Item 5 except as otherwise definitely noted. Admixtures used will be paid for under the applicable Item except for air entrainment agents.

The Contractor's unit price is to include the cost of form-work, ties, bracing, curing, finishing and all labor, equipment or materials required for or incidental to the Item. Also included is to be all forming around pipe openings and work of a like nature. All finishing is to be included in the Contractor's unit price for concrete. All waterstops and treatment of construction joints are to be included in the Contractors unit price.

ITEM 6

WATERPROOFING ADMIXTURE

Article 88A Work Included Under this Item, the Contractor will be required to add an integral waterproofing agent to the concrete on orders of the Engineer. In general, it is expected that all concrete placed in the spillway walls will contain the admixture.

Article 88B Description The admixture is to be added on the job site at the time that the concrete is being mixed. The admixture is to be in either liquid or powder form. It is to be used in accordance with the Manufacturers instructions. It is to be A.C. Hornis Hydratite or approved equal.

Article 88C Payment Payment will be made at the unit price specified in the Contract for each cubic yard of concrete placed with integral waterproofing admixture on orders of the Engineer. Payment under Item 6 is to be in addition to payment under Item 5. Payment under Item 6 will represent only the cost of the admixture.

The Contractors unit price is to include the cost of the admixture and all labor, equipment and materials required for or incidental to its addition to the concrete mix.

ITEM 7

Insulating Concrete

Article 89A Work Included Under this Item, the Contractor is to furnish and place the insulating concrete required around the 24" pipeline in the spillway section as shown on sheet #11 of the Plans.

The item is to include the placing of all mastic. The structural concrete shell is to be furnished and placed under Item 5.

Article 89B Construction The 24-inch pipeline is to be assembled and blocked at the required grade. The 4" vertical shell wall is to be constructed. The mastic is to be applied.

Insulating concrete is to be a mixture of one part of cement to six parts of expanded aggregate similar to Vermiculite or Fonalite. The mix is to have a slump of not less than 6" nor more than 9". Total mixing time is to be approximately 1 minute and overmixing is to be avoided.

The insulating concrete is to be poured or placed on one side of the pipeline and allowed to flow under the pipe until the other side is filled to the spring-line of the pipe. Thereafter concrete may be placed on both sides of the pipeline.

After the concrete has cured for 7 days, the top of the concrete is to be sealed with mastic and the 4" structural concrete cap is to be poured.

Article 89C Payment The Contractor will be paid the unit price specified in his Proposal for each cubic yard of insulating concrete measured in place in the completed work. The Contractor's unit price is to include all labor, equipment, and materials required for or incidental to the Item as herein described.

ITEM 8

REINFORCING STEEL

Article 90A Work Included All reinforcing steel furnished and placed on the Project is to be paid for under this Item.

Article 90B Materials Reinforcing steel used on this job shall be rolled from new billets. It shall be intermediate grade structural steel. Reinforcing shall conform to ASTM Specifications A-305.

Article 90C Cutting and Bending All bars shall be shop cut and bent and shall arrive on the job ready for use. All bars shall be clean and free of rust, oil, grease and other deleterious matter when delivered to the job and shall remain in that condition until incorporated structure.

The Contractor shall submit to the Engineer detailed plans and schedules of the reinforcing.

Article 90D Placement Steel shall be placed in the exact positions and with the spacing shown on the drawings or ordered by the Engineer. It shall be so fastened in position as to prevent being displaced during the placing of concrete. A correct distance between parallel rods shall be not less than the diameter of these rods. Where splices in reinforcement in addition to those indicated are necessary there shall be sufficient lap to transfer by bond the stress in the bar. Rods shall be sufficiently separated or properly connected together in such a manner as to develop the full strength of the rod.

All reinforcement shall be firmly supported by the use of metal bars, spacers, seats or anchors. The use of wood blocks is prohibited. The use of wire ties to hold the steel in correct relationship to the forms should be kept to a minimum. All reinforcement shall be placed on the day prior to the placement of concrete and in no case will the Contractor be allowed to place concrete without the Engineer's approval of the placement of the reinforcing.

Article 90E Measurement Measurement in computing the weights of the bars to be paid for the theoretical weight will be used. Wire or metal clips, seats and other supports necessary to hold the steel in place are not to be considered as a part of the reinforcement and no extra compensation will be given the Contractor for them.

The lengths of the bars to be paid for will be the actual lengths as installed in the work. This length is not to include any waste material due to the fact that the lengths supplied are longer than is necessary for their purpose. Laps and splices as shown on the drawings and other extra metal in laps where authorized will be included in the lengths to be paid for. Laps where allowed by the Engineer and required by the Contractor, in order to facilitate his work, but not a necessary part of the work, will not be paid for.

Article 90 F. Payment The General Contractor will be paid at the unit price specified in his Proposal for each pound of reinforcing steel furnished and placed in the completed work under this item.

The unit price specified by the Contractor in his proposal is to include all labor, equipment and materials required for or incidental to the work under this Item. It shall include all tie wire, seats, spacers, etc., and the labor of placing this material together in the completed work. The field work necessary in order to fit the reinforcing around various openings, recesses, etc., shall not be considered as extra work and will not be paid for as extra work.

The work necessary in the field, in order to fit reinforcement around various openings, recesses or inserts, shall not be considered as extra work and will not be paid for as extra work. The Contractor is warned to include this work of bending and cutting, where necessary, as a part of Item L-M.

ITEM 9

STRUCTURAL LUMBER

Article 91A Work Included Under this item, the Contractor is to furnish and place all lumber required for the spillway bridge, including iron angles, nailing pieces, nails and bolts.

Article 91B Lumber All lumber used on the job, including deck, nailing pieces and side bumpers is to be No.1 structural grade, nominal dimension, planed four sides. Wood is to be Douglas Fir, Yellow Pine or a similar species. All lumber shall be sound, well seasoned, straight grained and free of loose knots, decayed areas or any defect which will impair its strength or durability.

All lumber used is to be treated with creosote by the empty-cell process so that it contains at least 10 pounds of preservative per cubic foot of wood. All preserving is to be done with creosote oil meeting the requirements of AASHO Standard Specifications, Division II, Section 21, Grade I.

All timbers which are cut after the preservative has been applied are to have the cut areas treated with two coats of creosote oil before being installed in the work.

The bridge layout has been planned to use 2 x 8 timbers. At locations where 4 x 8 timbers are specified, the Contractor will be directed to substitute 2- 2x8's nailed together. Decking is to be 2x6 timbers.

Article 91C Fastenings All fastening devices used are to be made of best quality steel and shall be galvanized by the hot-dip method after threading.

The nailing pieces shall be fastened to the beams with a bolt every four feet. Alternate bolts shall be staggered on each side of the web of the beam. Bolt heads shall be counter sunk or otherwise recessed.

The fenders or bumpers shall be fastened using a bolt every four feet. These bolts are to pass completely thru the nominal 14" of material involved. No recessing required for these bolts.

All bolts that are tightened up against wood are to be fitted with a suitable, galvanized iron washer.

Article 91D Nailing All nailing is to be done using galvanized common nails.

The deck boards are to be attached to each beam at 2 locations. Two 40 d nails are to be driven on a slight diagonal at each location. Thus a total of 8 nails will be driven into each deck board.

All other nailing required is to be in accordance with standard practice and as required.

Article 91E Payment The Contractor will be paid the unit price specified in his proposal for each board foot of lumber furnished in place in the completed work as herein specified, including all labor, materials, equipment, bolts, nails and related items required for or incidental to the item.

All measurements of isolated pieces will be based on the actual length and nominal dimensions of the pieces. All measurements for the bridge deck will be based on the actual number of square feet installed and on the nominal thickness of deck installed. No allowance will be made for cut-off pieces or waste.

Included as a part of the cost of the structural lumber is to be the furnishing and installing of the anchor bolts and clip angles at each support. Four $\frac{1}{2}$ -inch diameter anchor bolts are to be furnished and set by the Contractor at each support. A $3 \times 3 \times \frac{1}{4}$ angle is to be set at each support for each main beam. The main beams are to be lagged to the iron angles.

ITEM 10

PIPE RAILS

Article 92A Work Included Under this Item, the Contractor is to furnish and install the pipe rails required for the spillway bridge and at the outer end of the spillway structure. The Item is to include all labor, equipment and materials incidental to the installation of the rails.

Article 92B Description The pipe rails are to be assembled from standard weight wrought iron pipe. All posts are to be spaced not more than six feet on centers and are to be extra heavy wrought iron pipe.

Each post is to be fastened to the supporting material at the bottom by two galvanized bolts. Bolts are to be hot dipped galvanized after threading. If supporting material is wood, galvanized iron washers are to be provided. If supporting material is concrete, L-type anchor bolts are to be set before pouring of the concrete.

Pipe rails on each side of the spillway bridge are to be provided. They are to be fastened by bolting through the 4-inch thick carrying members as shown on Sheet 13 of the Plans. Approximately 60 ft. of rail per side of the foot bridge are to be provided.

A pipe rail approximately 7' feet long is to be provided at the outer end of the spillway for safety in operating the 30" x 36" sluice gate. Anchor bolts are to be cast in the concrete for this pipe rail.

Article 92C Painting No shop painting of these rails is to be allowed. After assembly, the pipe rails are to be wire brushed and all threads and welds are to be spot coated with one coat of Koppers Bitumastic Super Service Black. The entire rails are then to be given two additional coats of the same paint applied at intervals of one week.

Article 92D Payment The Contractor will be paid the unit price specified in his proposal for each lineal foot of pipe rail, furnished in place in the completed work, including all assembly, fastening devices and painting.

ITEM 11

WATER CONTROL EQUIPMENT

Article 93A Work Included Under this item the Contractor is to furnish and install the screens and guides in the intake well.

Also, under this item the Contractor is to install the wall castings or thimbles for the five sluice gates, the gates themselves, stems and operating stands; all parts to be furnished by the Owner.

Article 93B Screens The double fish screens and guides as shown on sheet 11 of the plans are to be furnished and installed by the Contractor. All materials used are to be structural grade aluminum of the sizes shown.

In assembling the screens, the four angles used to form each side are to be beveled and welded at the corners. All corners are to be reinforced by fastening clip angles to the outstanding legs. The two sides of each screen section are to be securely bolted together at 2-foot intervals to hold the screen securely.

The screen is to be 1/4-inch mesh aluminum screen. The wire size is to be #16 gauge or heavier.

Article 93C Sluice Gates The following sluice gates are to be furnished by the Owner and installed by the Contractor.

- (a) Twenty-four inch circular sluice gates with extension stem, three stem guides and hand operated floor stand.
- (b) Sixteen-inch circular sluice gate with extension stem, three stem guides and hand operated floor stand.
- (c) Sixteen-inch circular sluice gate with extension stem, two stem guides and hand operated floor stand.
- (d) Six-inch circular sluice gate with extension stem, three stem guides and floor box.
- (e) Thirty-inch wide by thirty-six inch high, rectangular sluice gate with extension stem, 2 stem guides and hand operated, geared floor stand.

This equipment will be furnished complete, ready for assembly and installation by the Contractor. The equipment includes wall castings for all circular sluice gates and a wall thimble for the rectangular sluice gate. Also to be furnished by the Owner is stainless steel anchor bolts for installation of the stem guides and the floor stands and stainless steel bolts for attaching the sluice gates to the wall castings and thimbles. The Contractor is to supply Johns-Manville, Style 60 asbestos gaskets for the flanged joint between the wall castings or thimbles and the sluice gate.

The Contractor is to place the wall castings and thimbles in the forms prior to the placing of concrete. The castings are to be accurately leveled and plumbed. They are to be securely fastened to the forms and reinforcing steel and braced extremely so as to prevent any movement prior to or during the setting of the concrete.

The L-shaped anchor bolts for the stem guides (3 per guide) and the L-shaped anchor bolts for the floor stands (1 per stand) are to be placed accurately and securely prior to the setting of concrete.

After all concrete has set, the Contractor is to install the sluice gates, stems and floor stands under the supervision of a representative of the Chapman Valve Manufacturing Co. and as directed by the Engineer. When completely assembled, this entire unit is to be in good alignment and shall operate freely.

Upon completion of assembly, all threads and bushings are to be cleaned and lubricated. All portions of the gates, stems, stem guides and floorstands are to be clean and free of dirt, concrete droppings and other such material.

Article 93D Payment The Contractor will be paid the lump sum specified in his Proposal to work of furnishing and installing water control equipment as herein before described. This is to include the 6 sections of screens and the five sluice gates.

The Contractor's lump sum is to include the furnishing of all materials for the screens and guides and the furnishing of the gaskets for assembly of the sluice gates. It is also to include the installation in good working order of all these parts.

ITEM 12

Lock Joint Pipeline

Article 94A Work Included Under this Item the Contractor will lay the 24" raw water line, including fittings, all as furnished by the Owner.

The Owner will furnish the lock joint pipe and fittings including rubber gaskets and diaper cloth. The Contractor, under this Item, will be required to furnish the soap necessary to assemble the lock joint rubber and steel joint, the cement grout, and the gaskets and bolts for the assembly of one 24" flanged joint.

Article 94B Construction Methods The lock joint pipe is to be assembled in accordance with the standard instruction of the Manufacturer. After assembly the joint is to be grouted on the outside and mortared on the inside. Both grout and mortar is to contain a non-shrink admixture.

The pipe is to be laid to the line and grade shown on the plans. The section of pipeline within the spillway is to be supported on hard wood blocks at least two places per length. Portions of the pipeline laid in earth trench are to be supported on granular material. After assembly of the joint and prior to placing of the grout each pipe shall have soil well tamped underneath it and shall be partially backfilled.

The pipeline is to be laid starting at the 24" wall casting at the screen well. Laying is to proceed downstream to the end of the pipeline laid under the filter bed contract. The joint at the 24" wall casting is to be made with braided yarn and hot poured lead. Experienced men are to properly caulk this joint prior to the placing of insulating concrete under Item 7.

The Contractor under Item 12 is to include the cost of installing the closure piece between his pipeline and the pipeline laid under the filter bed contract. This closure piece will be furnished by the Owner and installed by the Contractor. After installation all exposed metal is to be given one coat of Kopper Bitumastic No. 50 and is to be encased or plastered with concrete at least 2" thick. All work in making the closure is to be supervised and directed by a representative of the Lock Joint Pipe Co. and is to be done to the satisfaction of the Engineer.

Upon Completion of the work under this Item, and prior to the placing of the insulating concrete or the concrete encasement and the enclosures, the Contractor is to test the pipeline by filling with water and placing it under 25 pounds of pressure. A visual search for leaks will be conducted.

Article 9hC Flanged Joint At the downstream end of the section pipe to be installed in the spillway, a 24" diameter flange is to be installed. The blind flange, tapped for 1" is to be furnished by the Owner. The General Contractor is to furnish a Johns-Manville Stype 60 asbestos gasket and 20-1 1/4 diameter bolts. After assembly of the flange all exposed metal is to be given one coat of Kopper Bitumastic No. 50.

The Contractor, as a part of the cost under Item 12, is to furnish and install a 1" copperation cock in the line flange. This item is to be extra heavy, all brass similar in quality to Muller, Red Hed, or equal.

Article 9hD Payment The Contractor will receive payment at the unit price stated in his proposal for each linear foot of 24" lock joint pipe furnished by the Owner and laid by the Contractor. The Contractor's unit price is to include assembly of the closurespiece, assembly of the flanged joint, blocking in the spillway and all other labor, equipment and material required for or incidental to the installation.

Excavation will be paid for under Items 3 and 4, as applicable. Backfill will be paid for under Item 20 as applicable.

ITEM 13

Underdrain

Article 95A Work Included Under this Item the General Contractor will furnish and install such underdrainage pipe as is required for the job. This Item applies in particular to the underdrainage pipe laid to relieve uplift on the spillway floor but will be used in the event springs are encountered in the East Side Hill and can be controlled only with drainage pipe.

Article 95B Materials Pipe furnished and laid under this Item is to be 8" vitrified clay pipe, extra strength, perforated and meeting the requirements of A.S.T.M. specified C-200. This pipe is to be laid true to line and grade with particular care exercised to see that the spigot is centered in the bell and that the invert of the various pipe sections are lined up. The bell of each length of pipe is to be filled with jute after the spigot has been inserted. The bells will not require the use of any poured compound.

Stone fill around the pipeline will be furnished and placed under Item 15.

Article 95C Payment The Contractor will receive payment at the unit price specified in his proposal for each linear foot of 8" extra strength, perforated, vitrified clay pipe furnished and laid under this contract as hereinbefore specified. The Contractor's unit price is to include the jute and centering and jointing the various pipe sections.

The Contractor will receive payment under Items 3, 4, 14, and 15 as applicable.

ITEM 14

GRAVEL BORROW

Article 96 A Work Included Under this item the Contractor shall furnish and place all bank run gravel borrow required on the job. This applies especially to the gravel shown as foundation material for the rip-rap on the face of the dam. It is also to include gravel borrow furnished as foundation material for pipes or structures, bank run gravel used as back-fill material on orders of the Engineer and gravel used as foundation material for paved road surfaces. In every case only gravel used within the specified pay lines will be paid for under this item. Any additional gravel borrow required to return the job site to its original condition will be furnished and placed in accordance with these specifications but at the Contractor's expense.

Article 96B Material Gravel borrow will be composed of hard, durable stone and coarse sand, free from loam and clay and when spread and compressed shall present a stable foundation. Materials which tend to be sandy or which fail to compact properly will not be accepted as gravel borrow. The gravel borrow shall be uniformly graded and shall contain no stones having a dimension greater than 4-inches.

Article 96C Placing of Gravel Gravel shall be handled and placed in such a manner as to prevent segregation. It shall be spread on a level, well compacted or undisturbed sub-base. Gravel shall be compacted in layers so as to form a stable and solid base.

Gravel placed as foundation material for the roadway is to be placed on a level, smooth and well compacted sub-grade. The gravel is to be placed in 6-inch layers and well compacted.

Article 96D Measurement Measurement of gravel used on this job is to be based on "load slips". Any gravel furnished and placed on orders of the Engineer is to be substantiated with load slips turned over to the Engineer at the time of hauling of the gravel.

Article 96E Payment The Contractor will be paid the unit price specified in his Proposal for each cubic yard of bank run gravel furnished in place in the completed work. The Contractor's unit price should include furnishing, hauling, spreading, grading and compacting of the gravel and all labor, equipment and materials required for or incidental to the Item.

ITEM 15

UNDERDRAINAGE STONE

Article 97A Work Included Under this item, the Contractor will furnish all stone required for drainage purposes on the entire job. This applies especially to the stone around the drain under the spillway floor but may be used at other locations on the job as directed by the Engineer.

Article 97B Material Washed stone shall be composed of hard durable stone obtained from natural banks or by crushing large stones from natural banks.

Crushed stone shall be composed of hard durable trap rock crushed to the required size. It shall be of the type normally obtained from the local Lane quarries.

The crushed stone or washed gravel shall be free of laminated stones, dust or fine crushings, dirt, clay and all other deleterious materials. It shall be of the size specified by the Engineer for the particular use under consideration. However, the Engineer guarantees to confine his requirements to the normal ranges of size stocked by the various pits and quarries in the area and no special blending will be required.

Article 97C Placing of Material At locations where the use of crushed stone or washed gravel is required by the Engineer, it shall be placed in accordance with his instructions. In general, every effort is to be made to keep the crushed stone or washed gravel free of clogging with native soils so that its use as underdrainage material will not be hampered.

Article 97D Measurement Measurement of stone used on this job is to be based on "load slips". Any stone furnished and placed on orders of the Engineer is to be substantiated with load slips turned over to the Engineer at the time of hauling of stone.

Article 97E Payment The Contractor will be paid the unit price specified in his Proposal for each ton of crushed stone or of washed gravel furnished in place in the completed work. The Contractor's unit price should include furnishing, hauling, spreading, grading and compacting of the stone, and all labor, equipment and materials required or incidental to the Item.

ITEM 16

Rip-Rap

Article 98A Work Included Under this item the Contractor is to furnish and place all rip-rap required for the upstream face of the dam and the spillway channel downstream of the dam.

Article 98B Materials Stone used for rip-rap shall be sound trap rock, cubical in shape, as normally obtained from the nearby Lane quarries. At least three-quarters of the stones furnished shall be more than 15" in their dimension and shall contain 5 cubic feet or more in volume. The remaining stone shall vary in size down to a minimum dimension of 4". The stones shall vary in size so that when placed in the completed work they will form a compact mass not subject to removal by the scour action of the water.

Article 98C Placement The rip-rap is to be replaced on the prepared sub-grade consisting of gravel. The trap rock is to be machine placed in a random fashion. The larger stones are to be placed so that they do not vary from established grade more than plus or minus 6". After the larger stones have been placed, the voids shall be carefully filled with smaller stone in a satisfactory manner. Upon completion of this operation, the embankment is to be covered within the limits shown on the plans with a 2-foot layer of rock, the surface of the rock not varying from the pre-determined requirements by more than 6".

Article 98D Measurement Measurement of rip-rap used on this job is to be based on "load slips". Any rip-rap furnished and placed on orders of the Engineer is to be substantiated with load slips turned over to the Engineer at the time of hauling of rip-rap.

Article 98E Payment The Contractor will be paid the unit price specified in his proposal for each ton of rip-rap furnished in place in the completed work. The Contractor's unit price should include furnishing, hauling, placing and grading of the rip-rap and all labor, equipment, and materials required for or incidental to the item.

ITEM 17

Cast Iron

Article 99A Work Included Under this Item the Contractor is to furnish and install the various cast iron steps and manhole frames required for the job. This is to include the cast iron step, frames, and cover at the screen well and the two cast iron frames and covers used for access to the end of the 24" pipeline in the spillway channel.

Article 99B Materials The cast iron steps used under this contract are to be as shown on the standard detail attached to the rear of these specifications. These steps are to weigh approximately 10 pounds each and are to be of the shape commonly referred to as "Metcalf and Eddy" pattern.

The manhole frame and cover used for access to the clear well and the two manhole frames and covers used as access to the pipeline are designated on the plans using numbers from the Clowe Catalogue. This is used solely to designate the type, size, quality and fastening devices required and is not intended to limit the purchase of these covers to a single manufacturer.

Article 99C Payment The General Contractor will receive payment under Item 17 at the unit price specified in his Proposal for each pound of cast iron to be paid for will be the actual weight of the pieces furnished by the Contractor and approved by the Engineer. The Contractor's unit price is to include all labor, equipment and material required for or incidental to the installation.

ITEM 18

ALUMINUM

Article 100A Work Included Under this Item, the Contractor is to furnish and place the aluminum stop log and guides required at the outer end of the spillway and the aluminum frame and cover required over the screens in the screen.

The aluminum screens, holder and guides in the screen well are to be furnished and placed under Item 11 of this Contract.

Article 100B Materials The items are to be assembled using the stock size plate and bars shown on the plans. The Contractor is to furnish the Engineer with shop fabrication plans showing details of assembly.

All aluminum used is to be a general purpose alloy and heat treat similar to 3003 and is to be suitable for the purpose intended.

Article 100C Payment The Contractor will be paid the unit price specified in his Proposal for each pound of aluminum furnished in place in the completed work as hereinabove specified and as shown on the plans. The weight to be used for payment purposes will be the calculated weight of the assembly. The Contractor's unit price is to include all labor, equipment and materials required for or incidental to the Item.

ITEMS 19 to 22 Inclusive

FILL

Article 101A Work Included Under these Items, the Contractor will haul and place all the fill required for construction of the dam.

In general, all pervious or sandy fill will be obtained from the east sidehill location and operation of this borrow pit will be confined to elevations above elevation 180.

The material in the easterly sidehill above elevation 180 is stratified and ranges from fine gravel and coarse sand to silt with fine sand predominating. Pervious fill hauled from this location without any regard for type of material will be paid for under Item 20.

If suitable layers of select pervious material occur so as to be accessible for removal, the Contractor will be instructed to remove this material for use as designated by the Engineer. Any overburden on these selected layers will be removed under Item 20.

If select granular material is not available or accessible at the borrow pit, its use will be eliminated and gravel under Item 14 will be substituted as directed by the Engineer.

The material in the westerly sidehill is the source of impervious material. In general, there are two types of impervious material available. Directly west of the dam site, there is a "fat" or pure clay available that will be used under Item 22 as the main core of the dam. Underlying this pure clay and also north of the 48-inch culvert is a "boney" hardpan that is to be used in the coffer dams and for the upstream section of the dam marked "semi-pervious" on the plans. This hardpan material is to be used under Item 21 of the Contract.

The Engineer reserves the right to alter the general proportions of select pervious (Item 19), random pervious (Item 20); semi-pervious (Item 21) and impervious (Item 22) materials from that shown on the Plans so as to fit the material actually being used in the construction of the dam.

Article 101B Cofferdams The cofferdams are required for the control of the brook and to allow for the construction of the core of the dam on the native impervious soils. The cofferdams are to be constructed of material furnished and placed under Item 21.

The construction of the upstream cofferdam and rock toe are to proceed across the valley simultaneously. They are to be carried out closely behind excavation for the cofferdams.

After completion of the upstream cofferdam, the contractor will construct the downstream cofferdam. The downstream cofferdam is

to be built regardless of whether or not it is needed for construction purposes since it is an essential part of the dam design.

Article 101C Core Wall The central portion or corewall of the dam is to be constructed using material furnished and placed under Item 22. The area between the cofferdams is to be excavated so as to expose native impervious material. This area is to be dewatered by methods satisfactory to the Engineer. The impervious material is to be placed "in the dry" and compacted under this condition. It is the Contractor's responsibility to provide suitable working conditions for the placement of the core.

Based on boring data, this native impervious material is covered with approximately 5 ft. of sand. The impervious material is a soft and "quakey" material that will not stand any "working" or vibration. Thus the placing of the corewall is to be carried out using considerable care.

First layer of material is to be placed approximately 24-inches thick and all material is to be placed with a free drop of less than 12-inches. This layer of material is to be compacted as directed by the Engineer, probably with two passes of a D-4 or equal dozer.

Subsequent layers of impervious material will probably be placed in 12-inch layers and compacted by not less than 2 passes of a D-7 or equal dozer.

Wheeled vehicles will not be allowed on the corewall until directed by the Engineer. This will probably not be allowed until at least 5 ft. of impervious material have been placed over the native impervious soils.

Article 101D Construction After completion of the cofferdams and the corewall to an elevation at least 5 ft. above the level of the native impervious material and such additional elevation as is directed by the Engineer, the construction will settle down to standard procedure.

All impervious material (Item 22) is to be placed in layers not more than 9-inches thick and compacted by at least 2 passes of a D-7 or heavier dozer. Compaction is to result in the density of the soil 6-inches below the surface being not less than 95% of the Standard Proctor Density. The Contractor will be expected to adjust moisture content and compaction methods as required to attain the required density.

All semi-pervious material (Item 21) is to be placed in layers not more than 12-inches thick. All stone more than 12-inch maximum dimension are to be removed and deposited in place of riprap on the upstream face of the dam. Compaction requirements are to be the same as for Item 22.

All random pervious and select pervious material is to be placed in 12-inch layers and compacted to 90% of Standard Proctor Density. Moisture content and compaction methods to be varied as required to attain the required density.

Article 101D Precautions All construction is to be carried on so as to adequately protect the partially constructed dam from damage.

Construction is to be carried on so that the top of the dam is level in the longitudinal direction. The top of the working area is to be kept crowned with the core always higher than the surrounding sections.

All material in place that has been damaged or softened by rain or frost is to be removed and replaced at no expense to the Owner.

Surfaces are to be roughened, harrowed or otherwise treated prior to the placing of successive layers of soil if so directed by the Engineer. Construction is to be carried on at all times using methods that will prevent stratification and zones of weakness in the completed embankment.

No roots, loam, brush or organic matter is to be incorporated in the embankment.

Article 101E Downstream Plateau Downstream of the dam, a sloping plateau is to be constructed. This is required in the design because of the low strength of the foundation material.

In general, this plateau is to be constructed using material excavated under Item 3. The sandy material is to be placed nearest the dam and impervious material is to be placed farther downstream. Peat and loam stripped from the dam site and from the borrow pit areas under Item 3 are to be used as cover material at this location.

The filter plant contractor has the right to dump excess material in this plateau area. This material will be leveled by the dam Contractor as necessary to provide for work under Item 23.

If necessary, additional material will be provided under Item 20 to bring the plateau to required grade.

Article 101 F Payment The Contractor will be paid the unit prices specified in his proposal for the applicable item for each cubic yard of material removed from the borrow pits, hauled to the dam and deposited in the completed work as herein described. The work is to include all measures required to compact the various soils to the required densities. All measurement of soil is to be made in place in the borrow pit areas.

ITEM 23

LOAM AND SEED

Article 102A Work Included Under this Item, the Contractor will be required to develop the grassed areas on the downstream slope of the dam, on the side slope of the access road from the dam to the treatment plant and on the plateau downstream of the dam. The work will include furnishing of loam as required, spreading of loam, fertilizing and liming, seeding and care of the grassed areas until such time as a strong and adequate growth of grass has occurred.

Article 102B Construction It is anticipated that the major quantity of loam required for the job will be hauled onto the job site by the Contractor.

Any loam required to make up a deficit at the job site is to be obtained by the Contractor under the provisions of this item at a location other than the Bear Hole Water Shed area. In other words, the Contractor will be required to go outside the Watershed area and obtain the loam at some other location.

The construction of the lawn areas is to consist of 2" of mulching and 4" of topsoil, properly limed, fertilized and seeded.

Mulch placed under this contract is to be approximately 2" thick and shall consist of leaves, leaf mold, peat, hay or straw, or a mixture of these materials.

After the spreading and placing of the mulch, the Contractor is to spread 4" of loam on top of the mulch. In the event that sufficient loam is not available at the job site for this amount of loam, the Contractor will be required to haul additional loam from outside sources. Loam shall consist of fertile, friable, natural topsoil typical of the topsoil in the locality. It shall contain a reasonable amount of organic matter and shall be free of stumps, roots, clay and stones. The loam is to be spread in a 4" layer using hand methods and equipment. After the loam has been spread it shall be carefully raked and fine-graded. All large lumps of earth, stones, brush, roots and foreign material are to be removed from the loam area during the fine-grading and satisfactorily disposed of. The loamed surface is to be rolled with a hand roller weighing not more than 100 lbs. per foot of width. In rolling, all depressions that occur are to be filled with additional loam and the surface re-graded and rolled until it presents a smooth and even finish that is up to the required grade.

The loamed area is to be treated with lime. The lime is to consist of pulverized limestone. All pulverized limestone will pass through a #20 sieve and at least 75% of it will pass through a #100 sieve. The ground limestone is to be a product registered for sale in the Commonwealth of Massachusetts. The limestone is to be spread at a rate of approximately 1/2 lb. per square yard and thoroughly raked into the upper portion of the topsoil. After raking in the limestone, the Contractor will be required

to thoroughly wet down the loamed area and at least 3 days are to elapse prior to the application of fertilizer.

After the required time has elapsed, the Contractor is to apply a chemical-type fertilizer having an analysis of 5-10-5 or better. Fertilizer is to be applied at the rate of 1 lb per 100 square feet of loamed area. Fertilizer is to be raked into the surface of the loam using wire rakes. The loamed area is then to be again thoroughly wetted and allowed to stand for approximately 3 days prior to the application of seed.

Prior to the placing of any seed, the Contractor shall lightly rake the surface of the soil to break up any caked or hard areas and to level off any eroded areas. Seed shall be sown only between the periods from April 15 to June 1, and from August 15 to October 15 or as directed by the Engineer. The Contractor shall not proceed with the work of seeding until written permission of the Engineer has been obtained. Where postponement of seeding is necessary and ordered by the Engineer, all weeds and other growth that may develop in the loamed areas are to be removed by the Contractor as directed by the Engineer without additional compensation.

The seed is to be applied at the rate of 1 lb. per 100 square feet. Seed shall be of the previous year's crop. The weed content of the seed shall not exceed 1% by weight. Grass seed shall consist of the following varieties and shall be germinative and pure to the degree by weight as indicated in the following table:

<u>Name</u>	<u>Proportion</u>	<u>Germination</u>	<u>Purity</u>
Red Fescue	60%	70%	85%
Red Top	20%	90%	90%
Kentucky Blue	70%	75%	90%

The Contractor will be responsible for the seeded areas until such time as the work has been officially accepted. During this period the Contractor will be required to water and cut the grass as necessary to develop the growth. If necessary, the Contractor is to erect suitable signs and barriers so as to protect the seeded areas.

After the grass has started, all areas which fail to show a uniform stand of grass for any reason whatsoever, shall be re-seeded and such areas or parts of areas shall be re-seeded repeatedly until all areas are covered with a satisfactory growth of grass.

Article 102C Payment The General Contractor will be paid the unit price specified in his proposal for each square yard of lawn area developed under this contract and within the paylines specified on the contract. The Contractor's unit price is to include the stripping of loam from the existing site, stockpiling

of loam, mulching, spreading of stockpile loam, hauling in of such additional loam as is required, liming, fertilizing, seeding and maintenance of the loamed and seeded areas until final acceptance of the contract. It is the Contractor's responsibility to provide a uniform stand of grass within the areas shown on the plans and described hereinabove and he is expected to take such steps as are necessary to develop and protect this grassed area during the life of this contract. If the Contractor desires to deviate in any manner from the procedures described hereinabove in order to develop the grassed areas, the Contractor is to submit his proposed deviations and changes to the Engineer for approval. Such deviations or changes will be approved by the Engineer providing they do not in any way substantially alter the intent of this specification in providing a well-developed and satisfactory stand of grass.

PROJECT: Local-Water Comm. TOWN W. Springfield - Bear Hole Water Supply Dam

Hoisting Engineer 3.00 (after 9/1/56, 3.10)

Assistant Engineer:

On Steam Machines 2.40 (after 9/1/56, 2.50)

On Other Machines 1.90 2.00

Crane Operator 3.00 3.10

Power Shovel Operator 3.00 3.10

Trenching Machine Operator 3.00 3.10

Tractor Operator 2.55 2.65

Bulldozer Operator 2.55 2.65

Grader Operator 2.55 2.65

220 cu. ft. or less 2.10
Compressor Operator (over 220 cu. ft. 2.55

Jack Hammer Operator 2.15

Roller Operator 2.47 $\frac{1}{2}$ 2.57 $\frac{1}{2}$

1 bag 1.90 2.00

Concrete Mixer Operator 2 or more 2.40 2.50

Pumpman 2.45 2.55

Other Power Driven

Equipment 2.47 $\frac{1}{2}$ 2.57 $\frac{1}{2}$

Bricklayer 3.27 $\frac{1}{2}$ 3.37 $\frac{1}{2}$

Cement Finisher 3.27 $\frac{1}{2}$ 3.37 $\frac{1}{2}$

Stone Cutter 2.25

Stone Mason 3.27 $\frac{1}{2}$ 3.37 $\frac{1}{2}$

Master Mech. 3.10 3.20

Maint. Engineer 2.47 $\frac{1}{2}$ 2.57 $\frac{1}{2}$

Mason Tender 2.15

Catch Basin & Manhole

Builder 3.27 $\frac{1}{2}$ (after 9/1/56, 3.27 $\frac{1}{2}$)

Carpenter 2.77 $\frac{1}{2}$ (after 6/1/56, 2.82 $\frac{1}{2}$)

Pile Driver & Cofferdam

Builder 2.85

Iron Worker 3.38 (after 7/1/56, 3.53)

Painter 2.55

Blaster 2.40

Truck Driver 2.19 $\frac{1}{2}$

Euclid Operator 2.45

Pipe Layer 1.90

Stone Soreader 1.90

Asphalt Raker 1.90

Curb Setter 2.65

Common Laborer 1.90

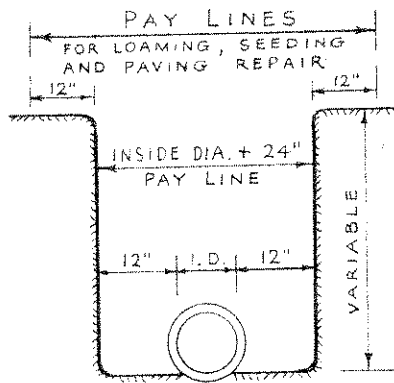
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Electrician 3.05

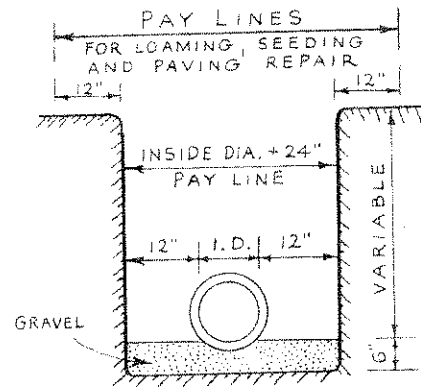
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Operator of 3

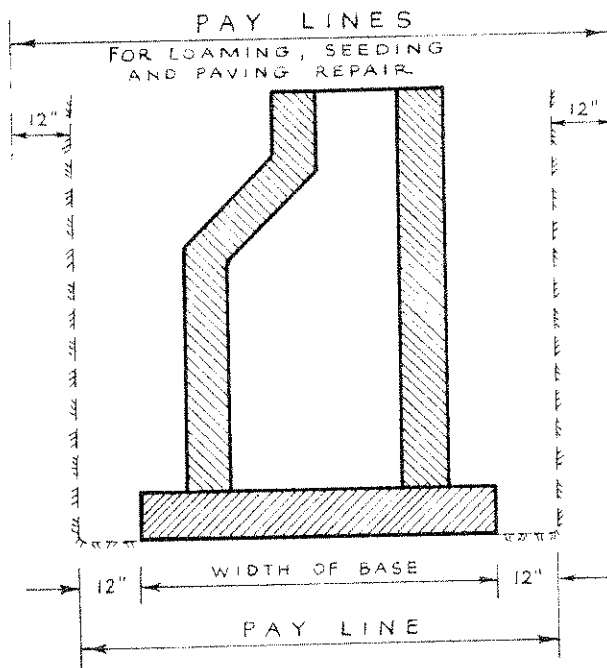
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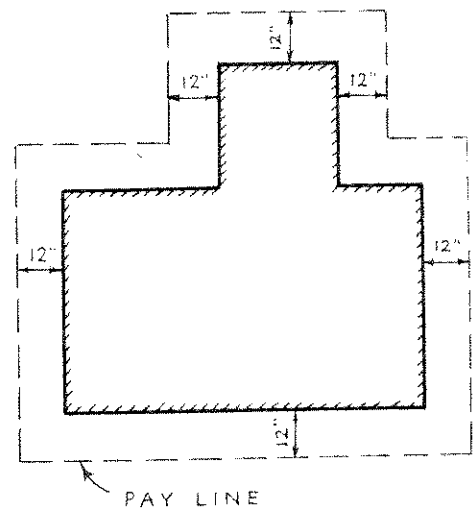
EARTH EXCAVATION
PIPE TRENCH



ROCK EXCAVATION
PIPE TRENCH



SECTION



PLAN

EXCAVATION FOR STRUCTURES

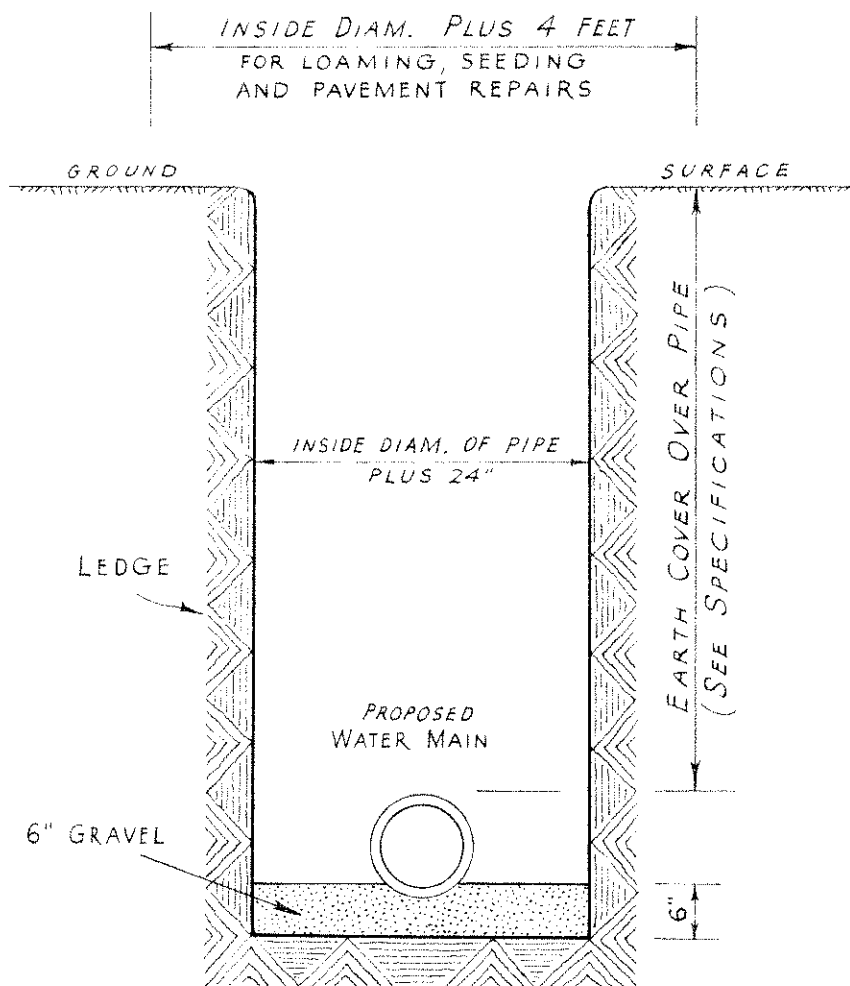
NOTE:

EXCAVATION WILL BE PAID FOR ONCE AND ONLY ONCE, REGARDLESS OF HOW OFTEN IT FALLS WITHIN THE PAYLINES FOR VARIOUS PIPES AND STRUCTURES DUE TO OVER-LAPPING OF PAYLINES AND REGARDLESS OF HOW OFTEN CONTRACTOR RE-HANDLES MATERIAL.

STANDARD DETAILS

PAY LINES

TIGHE & BOND, CONSULTING ENGINEERS
HOLYOKE, MASS.

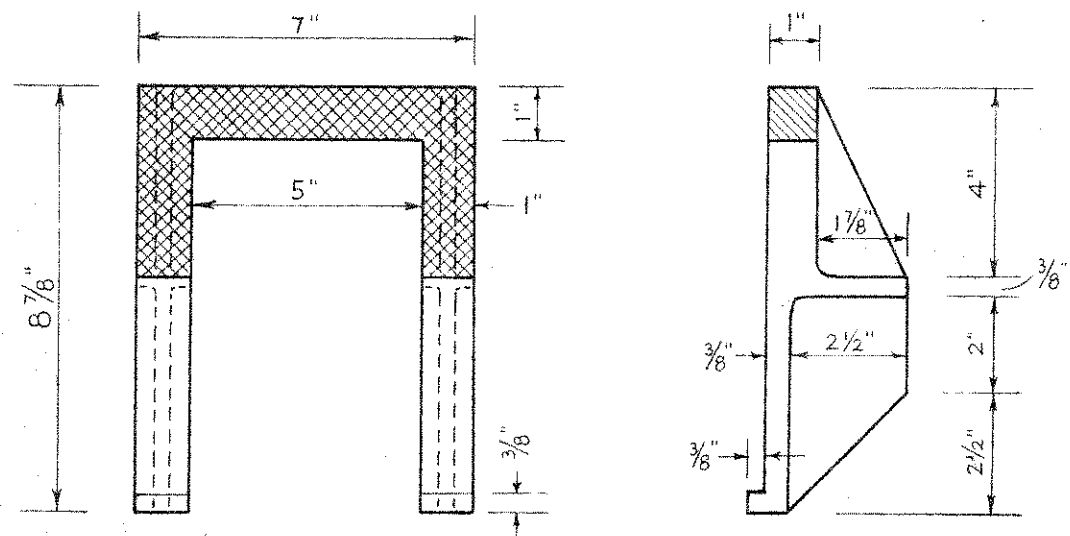


NOTE:

CONTRACTOR WILL BE PAID ONLY FOR
ACTUAL DEPTH OF LEDGE EXCAVATED IN
 CASES WHERE LEDGE IS OVERBURDENED
 BY AN EARTH COVER.

STANDARD DETAIL
 PAY LINES FOR ROCK SECTION,
 PAVING AND LOAMING, ETC.

TIGHE & BOND, CONSULTING ENGINEERS
 HOLYOKE, MASS.



NOTE:

ALL MANHOLE STEPS TO BE CAST IRON,
WEIGHT APPROXIMATELY 10⁰⁰.

STEPS TO BE PLACED 12" APART VERTICALLY,
ALTERNATE STEPS TO BE STAGGERED.

TOP STEP TO BE 12" BELOW TOP OF
THE MANHOLE COVER.

STANDARD
MANHOLE STEP

TIGHE & BOND, CONSULTING ENGINEERS
HOLYOKE, MASS.

CONTRACT



**TIGHE & BOND
CONSULTING ENGINEERS
HOLYOKE, MASS.**

C O N T R A C T

Clause 1. This Agreement, made this _____ day of _____ in the year nineteen hundred and fifty _____, between the

_____ herein referred to as the "Owner", and _____

_____ herein referred to as the "Contractor".

Clause 2. Witnesseth, That the parties to this Agreement, each in consideration of the agreements on the part of the other herein contained, do hereby agree, the Owner, for itself, and said Contractor for himself/themselves and his/their heirs, executors, administrators and assigns, as follows:

The Contractor agrees to furnish all equipment, machinery, tools and labor, to furnish and deliver all materials required to be furnished and delivered in and about the improvement and to do and perform all work in: _____

_____ in strict conformity with the provisions herein contained and the Advertisement for Bidders and Proposal hereto annexed, and the General Requirements and Special Provisions hereto annexed, and with the plans referred to therein. All said plans, general requirements, special provisions, addenda,

Advertisement for Bidders, and Proposal are hereby specifically made a part of this contract as fully and to the same effect as if the same had been set forth at length herein.

Clause 3. In consideration of the foregoing premises the Owner agrees to pay and the Contractor agrees to receive as full compensation for everything furnished and done by the Contractor under this contract; including all work required but not shown on the plans for the items herein mentioned, and for all loss or damage arising out of the nature of the work aforesaid, or from the action of the elements, or from any delay or from any unforeseen obstruction or difficulty encountered in the prosecution of the work, and for all risks of every description connected with the work, and for all expenses incurred by or in consequence of the suspension or discontinuance of the work as herein specified, and for well and faithfully completing the work, and the whole thereof, as herein provided, such price or prices as are set out in the accompanying proposal, and for

all work required, for which there is no item in the proposal, such compensation as is provided for in the aforesaid specifications.

IN WITNESS WHEREOF, the Owner has caused this instrument to be signed and its corporate seal to be hereto affixed in its behalf, and the Contractor has caused this instrument to be signed in its behalf.

For the Owner,

Witness:

)
)
)
)
)
)

By the

(
(
(
(
(

For the Contractor,

Witness:

By the

Westfield, Littleville Dam & Reservoir Project 1963



1963 Reports

Letter from the U S Army Corps of Engineers stating that the county owes \$450,000.00 for the Littleville Dam & Reservoir Project as of July 9, 1963.

City/Town	Westfield
Dam	Littleville Dam
Name	U S Army Corps of Engineers
Water	Littleville Reservoir

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS

424 TRAPELO ROAD
WALTHAM 54. MASS.

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.

NEDGB

9 July 1963


County Commissioners
Hampden County
Court House
Springfield, Massachusetts

file
RE: Littleville Dam and Reservoir Project
Contract No. DA-19-016-CIVENG-62-290

Gentlemen:

Additional funds in the amount of \$85,000 have been obligated for work to be performed by the Town and County under Contract No. DA-19-016-CIVENG-62-290 for road relocations on the Littleville Dam and Reservoir Project, making a total obligation to date of \$450,000.

Sincerely yours,


OTTO J. ROHDE
Colonel, Corps of Engineers
Deputy Division Engineer
Contracting Officer

Westfield - Littleville Dam & Reservoir Project



1961 Reports

Contract for relocation of two county highways in Chester for the benefit of the Westfield Littleville Dam & Reservoir Project.

City/Town	Westfield
City/Town	Chester
Streets	Kinney Brook Road
Streets	East River Road

September 27, 1961

Hubert C Hawkins M.D.P.W Dist. State Eng.
Myler R. Sturges " Asst Dist State Eng.
Lawrence H. Estes " Area Eng.
Thomas Rose Selectman Chester
Charles L. Daniels Selectman Chester
George Miller Selectman Chester.

The above named were present at a meeting on
September 27, 1961 and discussed the relocation of
two roads in Chester. It was decided that no progress
could be made in this matter unless all of the following
are present at one meeting:

- 1 Rep. of the City of Springfield regarding water supply.
- 2 Selectmen of Chester.
- 3 " " Huntington.
- 4 Hampshire County Commissioners.
- 5 Hampden " "
- 6 George H. McDonnell, Hampden County Hydraulic Engineer.
- 7 U. S. Army Engineers.
- 8 Rep. of the State Department of Public Works.

A meeting of this group will be arranged for some
future date.

Dict. by RPW/N

NEDRO

19 October 1961

Mr. William J. Goggins
District Highway Engineer
Commonwealth of Massachusetts
Department of Public Works
Veteran's Memorial Highway
P. O. Box 1151
Lenox, Massachusetts

Re: Littleville Dam and Reservoir Project -
Relocation of Highway Facilities

Dear Mr. Goggins:

Transmitted herewith are six copies of Cost Reimbursable Agreement proposed to be executed by the Town of Chester and County of Hampden and the United States of America for preliminary engineering services in connection with the relocation of Town and County Highway Facilities for this Flood Control Project. It is understood that you will review this instrument and, if satisfactory, recommend to the Town and County officials that they execute same.

It is desirable that this work be performed this fall. Therefore, it would be appreciated if your prompt attention be given to this matter. If I can be of any assistance to you or if you require any further information, please let me know. If satisfactory, one copy may be retained by the Town and another copy may be retained by the County pending return of fully executed copy of the Agreement.

Thank you for your cooperation in this matter.

Very truly yours,

J. M. GEOGHEGAN
Chief, Real Estate Division

1 Incl.
Agreement (6 cyps)

cc: Board of Selectmen, Town of Chester,
Town Hall, Chester, Mass.

County Commissioners, Hampden County, ✓
Springfield, Mass.



The Commonwealth of Massachusetts
Department of Public Works

DISTRICT #1 OFFICE
VETERAN'S MEMORIAL HIGHWAY, LENOX
P.O. BOX 1151, PITTSFIELD

October 23, 1961

CHESTER - Flood Control

Hampden County Commissioners
Court House
Springfield, Massachusetts

Gentlemen

These are the forms about which I spoke
on the telephone today to Mr. Walsh.

Mr. Stevens of our office will pick them
up at your office between 11 a.m. and noon on Wed-
nesday, October 25, 1961.

Very truly yours

A handwritten signature in blue ink that reads "W. J. Goggins".

William J. Goggins

WJGo
Enclosures-six

DISTRICT HIGHWAY ENGINEER

Myles Stevens
here Oct. 25/61

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
Corps of Engineers
424 Trapelo Road
Waltham 54, Mass.

Refer to File No. NEDGW

30 October 1961

PUBLIC NOTICE

A public meeting, sponsored by the Massachusetts Water Resources Commission, regarding the land acquisition for the Littleville dual-purpose flood control and water supply reservoir will be held at the Town Hall, Chester, Massachusetts on November 13, 1961 at 7:30 P.M.

The purpose of the meeting is to inform land owners of Government procedures and policies with respect to the acquisition of land. Other pertinent information on engineering features of the project, including relocations, will also be explained.

As the meeting is of a general nature only, it is not intended that individual problems will be discussed. Each individual case of acquisition will be treated separately at the appropriate time as funds become available.

SEYMOUR A. POTTER, JR.
Brigadier General, USA
Division Engineer

*Hampden County Comm.
Springfield, Mass.*

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
Corps of Engineers
424 Trapelo Road
Waltham 54, Mass.

Refer to File No. NEDGW

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SEYMOUR A. POTTER, JR.
Brigadier General, USA
Division Engineer

*Rec'd
Nov. 2/61
from Engr. Higgins*

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DIVISION, NEW ENGLAND

CORPS OF ENGINEERS

424 TRAPELO ROAD

WALTHAM 54, MASSACHUSETTS

OFFICIAL BUSINESS

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY

*Rec'd
October 20/61*

County Commissioners
Hampden County
Springfield, Massachusetts

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM 54, MASSACHUSETTS

NEERO

OFFICIAL BUSINESS

31 October 1961

SUBJECT: Designation as Authorized Representative of the Contracting
Officer in connection with Contract No. DA-19-016-CIVENG-62-98

TO: Mr. D. H. Steinhoff
Area Engineer
U.S. Army Engineer Division, NE
Westfield Area
Administration Building
Barnes Field
Westfield, Massachusetts

1. Pursuant to the provisions of ECI 1-451, ER 1180-1-1, you are hereby designated as my authorized representative to approve invoices submitted by the Town and County for provisional payment under Contract No. DA-19-016-CIVENG-62-98 dated 25 October 1961 entered into between the Town of Chester and County of Hampden, Massachusetts for preliminary engineering services for the relocation, rearrangement and/or alteration of Town and County highways in connection with the Littleville Dam and Reservoir Project.

2. Two (2) copies of said Contract are transmitted herewith.

3. It is your future responsibility to keep adequate records and to insure protection in the interest of the Government.

4. You are requested to ascertain from the Real Estate Division of this office that all the real estate terms and conditions of the subject contract have been complied with before approval of the final payment thereon.

1 Incl
as

OTTO J. RODE
Colonel, Corps of Engineers
Deputy Division Engineer
Contracting Officer

cc: Board of Selectmen,
Town of Chester, Mass.
County Commissioners, ✓
County of Hampden, Mass.

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS

424 TRAPELO ROAD
WALTHAM 54. MASS.

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.

NEDRO

31 October 1961

Board of Selectmen
Town Hall
Chester, Massachusetts

County Commissioners
Hampden County
Springfield, Massachusetts

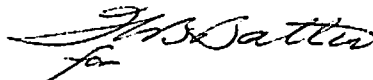
Re: Littleville Dam and Reservoir Project,
Relocation of Highway Facilities

Gentlemen:

Transmitted herewith is an executed copy of Contract No. DA-19-016-CIVENG-62-98 dated 25 October 1961 between the Government and the Town of Chester and County of Hampden, Massachusetts for preliminary engineering services relating to the relocation, rearrangement and/or alteration of Town and County Highways, in connection with the Littleville Dam and Reservoir Project.

It is requested that the Town and County immediately proceed with the work provided for therein.

Sincerely yours,



J. M. GEOGHEGAN
Chief, Real Estate Division

1 Incl
as

*Rec'd
Nov. 1, 1961*

CONTRACT NO. DA-19-016-CIVENG- 62-98

DATE 25 October 1961

CONTRACT FOR ENGINEERING SERVICES FOR
RELOCATION, REARRANGEMENT OR ALTERATION OF FACILITIES

(COST REIMBURSABLE)

Contractor: Town of Chester and County of Hampden,
Massachusetts

Contract For: Engineering Services for Relocation,
Rearrangement or Alteration of
Highway Facilities

Location: Littleville Dam and Reservoir Project,
Massachusetts

This contract is authorized by the following law:

Act of Congress Approved 3 July 1958
(Public Law 500, 85th Congress, (72 Stat. 297))

Appropriation: 96x3122 Construction General
Corps of Engineers, Civil

CONTRACT NO. DA-19-016-CIVENG-62-98

DATE 25 October 1961

CONTRACT WITH TOWN OF CHESTER AND COUNTY OF HAMPDEN, MASSACHUSETTS
FOR PRELIMINARY ENGINEERING SERVICES FOR
RELOCATION, REARRANGEMENT OR ALTERATION OF FACILITIES

(COST REIMBURSABLE)

THIS CONTRACT, entered into this 25th day of October 1961, between the UNITED STATES OF AMERICA (hereinafter called the "GOVERNMENT"), represented by the Contracting Officer executing this contract, and the TOWN OF CHESTER, a municipal corporation in the County of Hampden, Commonwealth of Massachusetts, (hereinafter called the "TOWN"), acting by and through its Board of Selectmen, and the COUNTY OF HAMPDEN, also in the Commonwealth of Massachusetts, (hereinafter called the "COUNTY"), acting by and through its County Commissioners.

WITNESSETH THAT:

WHEREAS, the Government has under authority of Public Law No. 500, 85th Congress (72 Stat. 297), approved July 3, 1958, undertaken the development of a flood control project known as the "Littleville Dam and Reservoir Project" (hereinafter called the "Project"); and

WHEREAS, the Town and the County are the holders of certain interests in land, licenses, permits, and statutory authority on which the Town and/or County have constructed and the Town is operating and maintaining certain facilities consisting of highways which interfere with the development and use of the project by the Government; and

WHEREAS, said highway facilities; namely, East River Road and Kinney Brook Road were originally laid out by County Commissioners of Hampden County but have been operated and maintained by the Town of Chester as part of its road system for many years; and

WHEREAS, it is necessary in the construction, completion and enjoyment by the Government of said Project that the aforementioned title, rights and privileges of the Town and the County be acquired, abandoned, modified and/or restricted, and that said facilities be removed, rearranged and/or altered; and

WHEREAS, it is necessary to perform preliminary engineering services at this time even though construction funds are not presently available, in order that the road relocations can be started early in Spring of 1962, when such funds will be available; and

WHEREAS, the Town and the County intend to have such preliminary engineering services for the road relocations performed by the Commonwealth of Massachusetts, Department of Public Works; and

WHEREAS, the actual work of relocation, rearrangement, abandonment or alteration of the highways including East River Road and Kinney Brook Road which are affected by this flood control project will be covered in a separate agreement or by modification hereof when construction funds are made available.

NOW, THEREFORE, in consideration of the faithful performance of each party of the mutual covenants and agreements hereinafter set forth, it is mutually agreed as follows:

ARTICLE 1. Obligations of the Town and the County. -

a. The Town and the County warrant and agree that East River Road and Kinney Brook Road were originally laid out by the County many years ago, that these roads were never discontinued as County highways, and that the Town has been operating and maintaining the same roads as part of the Town's highway system for many years under the control and jurisdiction of its Board of Selectmen.

b. The Town and the County shall furnish or cause to be furnished all services, labor, materials, tools and equipment necessary to perform the preliminary engineering services and make or cause to be made field surveys and investigations and soils explorations, preparation of final designs, preparation of contract drawings and specifications, schedules and plans, making right of way taking plans, preparing quantity surveys and cost estimate for raising and relocation of East River Road, and raising Kinney Brook Road in accordance with design criteria to be furnished by the Government at the locations shown on the plan entitled, "Connecticut River Flood Control, Littleville Reservoir, Highway & Cemetery Relocation, Middle Branch, Westfield River, Massachusetts" dated June 1961, Drawing No. CT-1-5701, Sheet 1 of 1, a copy of which is attached hereto, made a part hereof, and designated as Exhibit "A".

c. Procure all necessary permits and licenses; obey and abide by all applicable laws, regulations, ordinances, and other rules of the

United States of America, of the State, Territory or political subdivision thereof wherein the work is done, or of any other duly constituted public authority.

d. The Town and the County agree that no subcontract placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost-basis.

e. The Town and the County reserve the right to enter into an agreement or agreements with the Commonwealth of Massachusetts, Department of Public Works, for the performance of any or all of the work contemplated herein.

f. All of the work to be performed or cause to be performed by the Town and the County under subparagraph a above shall be subject to approval of the Contracting Officer.

ARTICLE 2. Obligations of the Government. -

a. Subject to the availability of funds the Government shall reimburse the Town and the County for all costs expended in connection with the performance of preliminary engineering services relating to the proposed relocation, rearrangement, and/or alteration of Town and County highways as provided in Article 1 hereof, such cost to include all items of expense properly chargeable thereto, including but not limited to acquisition of any necessary rights of way, easements, or other interests in real property, labor, materials, transportation, insurance, overhead charges properly allocable to the work, supervision, surveys, permits, rental of tools, equipment and machinery employed in the work, together with such other items of expense (exclusive of profit to the Town and the County) as should, in the opinion of the Contracting Officer, be included in the cost of the work. However, the Government will not reimburse for overtime work unless authority to work overtime is obtained from a duly authorized representative of the Contracting Officer prior thereto; provided, however, that no prior approval to work overtime will be required when emergency conditions or other conditions endangering the safety of life or property require that such overtime be performed. The total cost of such work is estimated at \$28,000.00. The Government shall reimburse the Town and the County monthly for such costs upon receipt of invoices, in quadruplicate, supported by such evidence of payment, made by the Town and the County as may be required by the Contracting Officer. All original time cards or payrolls, material records, and accounts for all charges and expenditures for which reimbursement will be claimed from the Government shall be available at all reasonable times to allow the Government to check and audit the invoices submitted by the Town and the County. So far as

practicable, separate records shall be maintained by the Town and the County on all items and accounts which shall constitute the basis of information from which the invoices will be prepared.

b. The Government shall furnish to the Town and the County design criteria for the performance of the preliminary engineering services required in Article 1 above.

ARTICLE 3. Salvage. -

The Town and the County shall provide for use of such materials, equipment and supplies from the facilities existing as of the date of this contract as can be placed in the facilities to be relocated, rearranged or altered hereunder; any materials, equipment, and supplies which it is mutually agreed by the parties hereto cannot be so used shall be removed from their original location and shall remain the property of the Town and the County. The agreed salvage value of such removed materials, equipment and supplies shall be credited to the Government in the form of a deduction to be made from the cost properly chargeable to the work to be performed in the proposed work. All items of materials shall be designated by the Town and the County as new, used or salvaged materials, whether said items are retained, discarded or altered in the prosecution of the work. If the parties fail to agree as to such salvage value, the decision of the Contracting Officer shall be final.

ARTICLE 4. Betterments. -

The Town and the County agree that the relocation, rearrangement and/or alteration will provide the Town and the County with facilities equal in service and utility to those now in existence and that any improvements in design, construction or capacity over and above what is required to provide facilities of equal service and utility shall constitute a betterment and will be furnished by the Town and the County at their own cost and expense; provided, however, that the term "betterments" will not be deemed to include more costly construction or design necessitated solely as a result of the relocation.

ARTICLE 5. Ownership and Conduct of the Work. -

a. The work performed hereunder shall be the property of the Town and the County. They shall be responsible for all materials furnished and work performed by them.

b. The Government may award other contracts for additional or other work in connection with the same project or in the same vicinity.

The Town and the County shall conduct operations so as to cooperate fully with any such work being performed by the Government and/or Government contractors and shall carefully fit their own work to that provided under other contracts as directed by the Contracting Officer. The Town and the County shall not commit or permit any act which may interfere with the performance of any such work by the Government and/or any Government contractor.

ARTICLE 6. Release. -

The Town and the County agree on completion of the work provided for herein, to accept the payment provided for in Article 2 above as full and just compensation for said preliminary engineering work and upon final payment as herein provided, the Town and the County agree to and do hereby release and agree to save and hold the Government harmless from any and all causes of action, suits at law or equity, or claims or demands or from any liability whatsoever for and on account of any damages relating thereto.

ARTICLE 7. Completion. -

The Town and the County will commence the work hereunder within five (5) days from the date of this contract and complete the same by February 1, 1962.

ARTICLE 8. Disputes. -

a. Except as otherwise provided in this contract, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Town and the County. The decision of the Contracting Officer shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the Town and the County mail or otherwise furnishes to the Contracting Officer a written appeal addressed to the Secretary. The decision of the Secretary or his duly authorized representative for the determination of such appeals shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. In connection with any appeal proceedings under this clause, the Town and the County shall be afforded an opportunity to be heard and to offer evidence in support of its appeal. Pending final decision of a dispute hereunder, the Town and the County shall proceed diligently with the performance of the contract and in accordance with the Contracting Officer's decision.

b. This "Disputes" clause does not preclude consideration of law questions in connection with decisions provided for in paragraph a above; Provided, that nothing in this contract shall be construed as making final the decision of any administrative officials, representative, or board on a question of law.

ARTICLE 9. Covenant Against Contingent Fees. -

The Town and the County warrant that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Town and the County for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage or contingent fee.

ARTICLE 10. Officials Not to Benefit. -

No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 11. Nondiscrimination in Employment. -

In connection with the performance of work under this contract, the contractor agrees as follows:

(1) The Town and the County will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The Town and the County will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Town and the County agree to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

(2) The Town and the County will, in all solicitations or advertisements for employees placed by or on behalf of the Town and the County, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

(3) The Town and the County will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the said labor union or workers' representative of the Town's and the County's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Town and the County will comply with all provisions of Executive Order No. 10925 of March 6, 1961, and of the rules, regulations, and relevant orders of the President's Committee on Equal Employment Opportunity created thereby.

(5) The Town and the County will furnish all information and reports required by Executive Order No. 10925 of March 6, 1961, and by the rules, regulations, and orders of the said Committee, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Committee for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Town's and the County's non-compliance with the non-discrimination clauses in this contract or with any of the said rules, regulations, or orders, this contract may be cancelled in whole or in part and the Town and the County may be declared ineligible for further government contracts in accordance with procedures authorized in Executive Order No. 10925 of March 6, 1961, and such other sanctions may be imposed and remedies invoked as provided in the said Executive Order or by rule, regulation, or order of the President's Committee on Equal Employment Opportunity, or as otherwise provided by law.

(7) The Town and the County will include the provisions of the foregoing paragraphs (1) through (6) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the President's Committee on Equal Employment Opportunity issued pursuant to section 303 of Executive Order No. 10925 of March 6, 1961, so that such provisions will be binding upon each subcontractor or vendor. The Town and the County will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions, including sanctions for non-compliance; Provided, however,

that in the event the Town and the County become involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the Town and the County may request the Government to enter into such litigation to protect the interests of the Government.

ARTICLE 12. Gratuities. -

a. The Government may, by written notice to the Town and the County, terminate the right of the Town and the County to proceed under this contract if it is found, after notice and hearing, by the Secretary or his duly authorized representative, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Town and the County, or any agent or representative of the Town and the County, to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing of such contract; provided, that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

b. In the event this contract is terminated as provided in paragraph a. hereof, the Government shall be entitled (1) to pursue the same remedies against the Town and the County as it could pursue in the event of a breach of the contract by the Town and the County, and (2) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Town and the County in providing any such gratuities to any such officer or employee.

c. The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

ARTICLE 13. Definitions. -

a. The term "Secretary" means the Secretary of the Army; the terms "Secretary of the Army" or "Head of the Department" as used herein shall have one and the same meaning; and the term "his duly authorized representative" means the Chief of Engineers, Department of the Army, or an individual or board designated by him.

b. The term "Contracting Officer" as used herein shall include his duly appointed successor or his authorized representative.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

WITNESSES:

Morris S. Phillips
Name

Worcester, Mass.

THE UNITED STATES OF AMERICA

By Otto J. Rohde

OTTO J. ROHDE
Colonel, Corps of Engineers
Deputy Division Engineer
Contracting Officer

TOWN OF CHESTER

By Thomas Rose

Charles A. Hamill

George Miller

BOARD OF SELECTMEN

Name

Address

Myler R. Stearns

Box 105 Main St

Southfield Mass.

Name

Address

William J. Foley

31 Elm St

Springfield Mass

COUNTY OF HAMPDEN

By Ralph P. Walsh

Thomas F. Pulliam

William B. Houghton

COUNTY COMMISSIONERS

CERTIFICATE

I, Nicholas Sebastiano, certify that I am the Town Clerk of the Town of Chester of the Commonwealth of Massachusetts and that Thomas Rose, Charles S. Daniels, and George Miller, who signed this contract on behalf of the Town of Chester were then and there the duly elected and qualified Selectmen of the Town of Chester, and that said contract was duly signed for and on behalf of the Town of Chester by virtue of their authority and is within the scope of their statutory powers,

IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of the Town of Chester this 25th day of October 1961.

Nicholas D. Sebastiano
Town Clerk

TOWN SEAL

CERTIFICATE

I, Edward G. Shea, certify that I am the Clerk
of the County Commissioners of the County of Hampden of the Commonwealth of
Massachusetts, and that Ralph P. Walsh, Thomas F. Sullivan,
and William F. Stapleton, who signed this contract on behalf of the
County of Hampden of the Commonwealth of Massachusetts were then and there
the duly elected and qualified County Commissioners of the County of
Hampden of the Commonwealth of Massachusetts; that said contract was duly
signed for and on behalf of the County of Hampden and is within the scope
of their powers as County Commissioners.

IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of
the County of Hampden this 25th day of October 1961.

Edward G. Shea

(SEAL)

Prior to Nov. 13/61 meeting, will be glad to show C Cs or their representative where the new relocated road will go, the line through woods. Road will be $2\frac{1}{2}$ miles through the woods.

Nov. 7, 1961.

Re: Littleville Dam
and Reservoir project,

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS

424 TRAPELO ROAD
WALTHAM 54, MASS.

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.

NEDRO

9 November 1961

County Commissioners
Hampden County
Springfield, Massachusetts

Re: Littleville Dam and Reservoir Project,
Contract No. DA-19-016-CIVENG-62-98

Gentlemen:

Reference is made to the subject contract for preliminary engineering services in connection with the relocation of Town and County highways for this Flood Control Project.

Because this Contract is entered into jointly with the Town and County, it is necessary that invoices calling for payment be submitted to the Government on the joint letterheads of the Town and County. Such invoices must also be sufficiently broken down and itemized so that a proper audit may be made.

Sincerely yours,


J. M. GEOGHEGAN
Chief, Real Estate Division

NEDRO

23 January 1962

Board of Selectmen
Town Hall
Chester, Massachusetts

Re: Littleville Dam and Reservoir Project,
Contract No. DA 19-016-CIVENG-62-98

Gentlemen:

I have not received any information on the Articles transmitted with my letters of 9 November 1961 and 1 December 1961, which were to be included in Warrant for special Town meeting to authorize the Selectmen to enter into Relocation Agreements for the Town roads, the Fisk and Eastman cemeteries and the fire station buildings all of which are affected by this Flood Control Project.

I have heard from Mr. Goggins of the Massachusetts Department of Public Works that the Town intends to include an Article in the annual Town meeting Warrant for late February of 1962 for the necessary authorization.

Inclosed are drafts of three Articles; one covers the Town roads, the second covers the two cemeteries and the third covers the fire station buildings. Even though the roads have top priority, I feel that it would be best for the Selectmen to obtain the necessary authority at the annual Town meeting. I appreciate receiving your comments in this matter. If I can be of any further assistance to you, please let me know.

Sincerely yours,

J. M. GEOGHEGAN
Chief, Real Estate Division

1 Incl
as

cc: Mr. William J. Goggins, District Engineer, Mass. Public Works Dept.,
P.O. Box 1151, Lenox, Mass.

County
~~County~~ Commissioners, Hampden County, Springfield, Mass. ✓

Westfield - Powermill Brook Dam - Specifications



1962 Reports

Specifications filed June 13, 1962 approved by Hampden County Commissioners July 25, 1962.

City/Town	Westfield
Dam	Powdermill Brook Dam
Water	Powdermill Brook

Powdermill Brook

HAMPDEN COUNTY
APPROVED

JUL 25 1962

CONSTRUCTION SPECIFICATIONS

1 - CLEARING

Walter A. Walsh

Thomas F. Sullivan

William F. Stoughton
County Commissioners

1.1 SCOPE

This specification covers the clearing from designated areas of all trees, brush, stumps, logs, down timber, woody vegetation, shrubs, stone walls, fences, minor structures when shown on the drawings, and all rubbish and the disposal of all materials resulting from the clearing operations.

1.2 CLEARING

Trees, brush, shrubs, stumps and other woody growth shall be cleared flush with the ground surface. Such growth may be cleared by cutting, pulling, grubbing or other approved methods. Trees shall be felled in such a manner as to avoid damage to trees to be left standing, to existing structures or installations and with due regard for the safety of persons and property.

1.3 TIMBER SALVAGE

All timber, in the areas to be cleared, shall become the property of the Contractor and shall be disposed of as specified under Item 1.4 (DISPOSAL OF REFUSE) or removed from the site prior to completion of the contract.

1.4 DISPOSAL OF REFUSE

All cleared material not salvaged shall be disposed of by burning, burying or other method approved by the Engineer. The time, location and manner of burning shall be subject to all public laws governing such operations and the Contractor shall be responsible for any damage to life and/or property caused by fires resulting from his operations. Where the work includes the removal of elm trees, such trees shall be disposed immediately after cutting and in such a manner as to prevent the spread of the Dutch elm disease. This shall be accomplished either by completely burning the trees or covering the trees with earth to a depth of at least six inches.

1.5 MEASUREMENT AND PAYMENT

The authorized area of clearing will be measured to the nearest one-tenth (0.1) acre. Clearing of material sites or borrow areas outside the designated area which the contractor elects to develop at his own option will not be measured or paid for. Approximate areas to be

Commonwealth of Massachusetts - Hampden Co.
"Specifications" - Filed June 13, 1962

cleared will be shown on the drawings and shall be staked or otherwise designated by the engineer in the field. In the case of isolated trees, the diameter of the crown squared will be used as the area. Payment will be made at the contract unit price per acre for "Clearing" and shall be considered full compensation for all material, labor, equipment and any incidentals necessary for clearing and disposal of cleared materials.

2 - CLEARING AND GRUBBING2.1 SCOPE

This specification covers the clearing from designated areas of all trees, brush, shrubs, logs, down timber, vegetation, stone walls, fences, minor structures when shown on the drawings, rocks and boulders, between 6 inches in diameter and one cubic yard in volume, and all rubbish and the grubbing of all stumps and woody roots and the disposal of all material resulting from the clearing and grubbing operations.

2.2 CLEARING AND GRUBBING

Clearing and grubbing shall consist of the removal of trees, brush, shrubs, stumps and other woody vegetation from above the ground surface; and the removal of all stumps, roots of one inch in diameter or larger, buried logs, rocks and boulders between six inches in diameter and one cubic yard in volume, sod and other objectionable material to a minimum depth of two feet below a structure subgrade and one foot below embankment foundation.

2.3 TIMBER SALVAGE

All timber, in the areas to be cleared, shall become the property of the Contractor and shall be disposed of as specified under Item 2.4 (DISPOSAL OF REFUSE) or removed from the site prior to completion of the contract.

2.4 DISPOSAL OF REFUSE

All cleared and grubbed material not salvaged shall be disposed of by burning, burying or other method approved by the Engineer. The time, location and manner of burning shall be subject to all public laws governing such operations and the Contractor shall be responsible for any damage to life and/or property caused by fires resulting from his operations. Where the work includes the removal of elm trees, such trees shall be disposed immediately after cutting and in such a manner as to prevent the spread of the Dutch elm disease. This shall be accomplished either by completely burning the trees and stumps or covering the trees and stumps with earth to a depth of at least six inches.

2.5 MEASUREMENT AND PAYMENT

The authorized area of clearing and grubbing will be measured to the nearest one tenth (0.1) acre. In the case of isolated trees, the diameter of the crown squared shall be used as the area. Approximate

areas to be cleared will be shown on the drawings and shall be staked or otherwise designated by the engineer in the field.

Payment will be made at the contract unit price per acre for "Clearing and Grubbing" and shall be considered full compensation for all material, labor, equipment and any incidentals necessary for clearing and grubbing and disposal of cleared and grubbed materials. When "Clearing and Grubbing" is not shown as an item in the bid schedule, the price for such work specified herein shall be a subsidiary of the other items and no separate payment will be made for "Clearing and Grubbing" as such.

4 - EXCAVATION

4.1 SCOPE

This specification covers the required excavation, the removal and proper utilization or disposal of all excavated materials, and the shaping and finishing of all excavation work to the required lines, grades and cross sections.

4.2 CLASSIFICATION

4.2.1 General. All excavation to be paid for will be shown on the drawings under one of the following classifications:

Excavation - Common
Excavation - Rock

4.2.2 Excavation; Common. Common excavation shall consist of and include all earth, clay, sand, silt, gravel, shale, hard and compacted materials, such as hardpan, loosely cemented gravel, soft or disintegrated rock and similar materials that can be removed by hard, heavy ripping equipment, or common earth-moving equipment such as tractor-drawn scraper, power shovels, backhoes, and push tractors, and shall also include all boulders and loose rock less than one (1) cubic yard in volume.

The heavy ripping equipment, as specified hereinbefore, shall consist of a ripper or rooter unit weighing not less than eight thousand five hundred (8,500) pounds, equipped with a hard faced steel tooth, as recommended by the manufacturer, and drawn by a track-type tractor of not less than one hundred (100) draw-bar horsepower, in good condition and capable of developing not less than twenty-eight thousand (28,000) pounds draw-bar pull in first gear.

4.2.3 Excavation; Rock. Rock excavation shall consist of and include all excavation which, in the opinion of the Engineer, cannot be removed by the methods described hereinbefore for common excavation, and shall also include all boulders and detached rock one (1) cubic yard or greater in volume. In areas where blasting is not permitted, materials of rock character which require the use of power operated drills for removal will be classified as rock excavation.

4.3 TYPES OF EXCAVATION

4.3.1 General. The types of excavation herein specified indicate the general character and location of the excavation work to be performed.

The types of excavation covered herein are:

- Embankment Foundation Excavation
- Cutoff Trench Excavation
- Foundation Drain and/or Toe Drain Trench Excavation
- Channel Excavation
- Emergency Spillway Excavation
- Borrow Excavation

All excavations shall be completed to the lines and grades shown on the drawing or as directed by the Engineer. Unauthorized excavation beyond such limits and the backfill required to replace unauthorized excavation will not be paid for and the cost shall be borne by the Contractor. All material thus removed (without proper authorization) shall be replaced by concrete when a concrete structure is to be placed upon or against such surface, or by compacted fill material when fill is to be placed thereon. Prior to the start of any excavation the Contractor shall inform the Engineer in sufficient time to allow for cross sectioning of the excavation area. No back-fill shall be placed in an excavated area until the excavation has been approved by the Engineer. All loose material must be removed from such areas before backfilling.

The types of excavation that are considered subsidiaries of other items shall be so specified herein.

4.3.2 Embankment Foundation Excavation. Embankment foundation excavation shall consist of the required excavation for the removal of unsuitable material from the embankment area. The final depths and extent of the excavation will be determined by the nature of the material revealed in the area and by borings and/or soundings (such borings or soundings to be performed by the Engineer).

4.3.3 Cutoff Trench. Cutoff trench excavation shall consist of and include the removal of all materials encountered or involved in such excavation at the location shown on the drawings or as directed by the Engineer. The final depths and extent of the trench will be determined by the nature of the material revealed in the trench and by borings and/or soundings. (Such borings or soundings to be performed by the Engineer).

4.3.4 Structure. Structure excavation shall consist of the removal of all materials encountered or involved in the excavation and sub-grade preparation for the placing of structures other than embankments. The final depths and extent of structure excavation will be determined by the nature of the material revealed and by borings and/or soundings.

4.3.5 Foundation Drain and/or Toe-Drain Trench. Foundation drain or toe-drain trench excavation shall consist of and include the removal of all materials encountered or involved in the construction of the drainage system as shown on the drawings. Direct payment for foundation or toe-drain trenches will not be allowed. Payment for such excavation shall be subsidiary to filter material as covered under specification no. 13, Structural Drainage.

4.3.6 Channel. Channel excavation shall consist of the required excavation for all channels and constructing, shaping and finishing all earth work involved for channels outside the embankment limits. Overcutting will be allowed six (6) inches below grade, but no payment will be made for the variance resulting from the overcutting.

4.3.7 Emergency Spillway. Emergency spillway excavation shall consist of and include the required excavation to construct the emergency spillway as shown on the drawings or as directed by the Engineer and the proper utilization of such excavated material.

Suitable fill material excavated from the emergency spillway will not be paid for as excavation but will be paid for at the contract unit price for the class of fill in which it is placed. The selection of material suitable for fill shall at all times be as directed by the Engineer.

Rock encountered in the emergency spillway will be paid for as rock excavation.

Unsuitable or surplus material other than rock excavated from the emergency spillway and required to be wasted will be paid for as common excavation.

4.3.8 Borrow. Borrow excavation shall consist of and include the required excavation and proper utilization of approved materials, obtained from designated areas when sufficient quantities of suitable materials are not available from other required excavations.

The control of excavation in any borrow area and the selection of materials therefrom shall at all times be as directed by the Engineer. On completion of excavation, all borrow pits shall be left in a neat and sightly condition. Unless otherwise approved by the Engineer, all borrow pits shall be so graded and dressed that water will readily drain therefrom, and away from all embankments, berms, and structures. Borrow excavation will not be paid for as excavation but will be paid for at the contract unit price for the type of fill in which the material is placed.

4.4 CONSTRUCTION METHODS

4.4.1 Utilization of Excavated Material. All suitable material removed from the excavations shall be used insofar as practicable, in construction of the permanent works and at such other places as directed. The Contractor shall not waste materials removed from excavations and suitable for use in the construction of the permanent works, without a written application to do so and a written approval from the Engineer.

4.4.2 Disposal of Surplus and/or Waste Material. All surplus excavated material and/or all waste material shall be disposed of in areas shown on the plans or areas approved by the Engineer.

Waste material shall be placed in designated waste areas to the approximate elevations established by the Engineer, and the surfaces thereof shall be left in a neat and sightly condition and sloped to provide positive drainage. Compaction of the waste materials will not be required. The cost of disposal of all materials, unless otherwise specified, and all costs of placing and spreading the materials in the waste areas and dressing of the surfaces thereof shall be included in the respective contract unit prices for excavation, regardless of the source of materials, and no additional payment will be made therefor.

4.4.3 Blasting for Excavation. Blasting may be done only to the depth, amount, and extent, and in such locations approved by the Engineer. This approval will not relieve the Contractor of his responsibility in the blasting operation, and no payment will be made for any necessary extra excavation below or outside of the limit lines indicated on the drawings, or modifications thereof, due solely to injury caused by over-shooting, improper blasting, or carelessness on the part of the Contractor.

All blasting operations will be carried out in accordance with Federal, State and Local laws and requirements as set forth in Section 9 of the 'Manual of Accident Prevention in Construction', Fifth Edition, as published by the Associated Contractors of America, Inc.

4.4.4 Sheeting and Bracing. Sheeting and bracing as may be required to safely support the sides of excavations shall comply with the safety precautions as outlined in current and accepted safety manuals, such as 'Manual of Accident Prevention in Construction', published by the Associated General Contractors of America, Inc.. Where sheeting and bracing are necessary to prevent caving of the walls of excavations and to safeguard the workmen, the excavations shall be dug to such widths that proper allowance is made for the space occupied by the sheeting and bracing. The Contractor shall perform the additional excavation required and furnish and put in place the necessary sheeting and bracing and shall remove the same as the excavation is filled, at his own expense.

4.4.5 Removal of Water. The Contractor shall construct and maintain all necessary cofferdams, channels, flumes, and/or other temporary diversion and protective works; shall furnish all materials required therefor; and shall furnish, install, maintain, and operate all pumping and other equipment for dewatering the various parts of the work' (including borrow areas), and for maintaining the foundations, cutoff trenches, and other parts of the work free from water as required for constructing each part of the work. After having served their purpose, all cofferdams and other temporary protective works shall be removed

or leveled, to give a slightly appearance and so as not to interfere in any way with the operation, usefulness or stability of the permanent structures. No separate payment will be made for construction of temporary diversion and protective works, furnishing and operating pumping equipment, or other dewatering costs, since performance of this work is to be considered as subsidiary to work pertaining to the various contract items.

4.5 MEASUREMENT AND PAYMENT

The volume of the classes and types of excavation to be paid for will be measured by cross-section surveys before and after the excavation operations. It will be measured between (1) the surface lines as determined by a cross section survey after clearing and grubbing, removal of topsoil and foundation preparation, and (2) the neat lines, grades, and typical sections shown on the drawings or as modified by the Engineer. The volumes of the classes of excavation to be paid for will be computed to the nearest cubic yard by the method of average cross-sectional end areas.

Common excavation will be paid for at the contract unit price for "Excavation; Common". Rock excavation will be paid for at the contract unit price for "Excavation; Rock." Such payment shall be considered full compensation for furnishing all labor, materials, equipment, and incidentals necessary to complete the work as specified herein.

5 - EARTH FILL

5.1 SCOPE

This specification covers the foundation preparation for embankments and the materials, material placement, spreading, moisture control and compaction requirements for compacted fill, semi-compacted fill, uncompacted fill and backfill.

5.2 DEFINITIONS

"Embankment". The earth and/or rock fill portion of the permanent work such as an earth dam, dike or levee.

"Backfill". The refill of excavated areas around or adjacent to a structure which cannot be placed until the structure is completed or until a specified time has elapsed after concrete has been placed.

"Foundation". The prepared or natural surface upon which the embankment or earth fill is to be placed.

"Compaction". A mechanical process whereby the density of the soil is increased by rolling, tamping or other approved method.

"Optimum Moisture Content". The moisture content at which a specified amount of compaction effort will produce the maximum density of the soil.

"Maximum Dry Density". The dry density of a soil obtained by a specified amount of compaction effort at the optimum moisture content.

5.3 GENERAL PROVISIONS

5.3.1 Lines and Grades. All types of fills shall be constructed to the lines, grades, and cross sections indicated on the contract drawings unless otherwise directed by the Engineer. All finished surfaces shall be generally smooth and pleasing in appearance.

5.3.2 Conduct of Work. The Contractor shall maintain and protect all fill in a satisfactory condition at all times until final completion of all work under the contract. Any approved fill material which is rendered unsuitable after being placed in the fill, and before final acceptance of the work, shall be replaced by the Contractor in a satisfactory manner and no additional payment will be made therefor. The Contractor may be required to remove, at his own expense, any fill material placed outside of the prescribed lines.

Access and haul roads shall be located and constructed as approved by the Engineer. They shall be constructed to be free draining and shall be maintained in good condition throughout the contract period, unless otherwise directed by the Engineer.

5.4 TYPES OF FILL

5.4.1 General. All authorized earth fill will be shown on the drawings and/or specified in the bid schedule or ordered in writing by the Engineer under one of the following types:

Compacted Fill
Semi-Compacted Fill
Uncompacted Fill
Back Fill

5.4.2 Compacted Fill. Compacted fill shall consist of and include all fill deposited in layers and compacted by rolling or tamping to a specified density. Compacted fill constructed under this specification will be classified according to the specified percent of maximum dry density compaction to be secured, in conformance with the requirements of the following table:

CLASSIFICATIONS OF COMPACTED FILL

Required Percent of Maximum Dry Density	Class of Compacted Fill		
	Compaction Test		
	Modified	A.A.S.H.O.	Proctor
100		A-1	B-1
95		A-2	B-2
90		A-3	B-3
Note: Maximum density shall be determined for all Class A fill by the test procedure specified in ASTM Standard D 1557, Method A, and for all Class B fill by the test procedures specified in ASTM Standard D 698.			

Each class of fill shall be used in such structures or in such portions of designated structures as called for on the drawings and/or in the bid schedule or as directed, in writing, by the Engineer. The type of roller and the minimum pressure in pounds per square inch to be exerted by the roller may be called for on the drawings.

5.4.3 Semi-Compacted Fill. Semi-compacted fill shall consist of and include all fill deposited in layers and compacted by the following method:

a. Each lift shall be compacted by not less than two (2) complete passes of a tamping roller exerting a minimum pressure of two hundred (200) pounds per square inch.

5.4.4 Uncompacted Fill. Uncompacted fill shall consist of and include all fill, except backfill, deposited in gullies, depressions, and other approved locations, without regard to selection of material, or spreading, or compaction, so long as the final grade of the filled area is left in a reasonably smooth condition.

5.4.5 Backfill. Backfill shall consist of and include the refilling of excavated areas around and/or adjacent to conduits and/or other structures and compacting such fill to the required density as specified in 5.4.2.

5.5 FOUNDATION PREPARATION

5.5.1 Compacted and Semi-Compacted Fill. After completion of all required clearing and grubbing operations, removal of topsoil and unsuitable foundation material, the foundation area shall be loosened thoroughly by scarifying or plowing to a minimum depth of six (6) inches, except in areas where this requirement is waived by the Engineer. After removal of roots or other debris turned up in the process of loosening, the entire surface area of such section of embankment foundation shall be compacted to the same density as herein-after specified for the class of fill to be placed immediately above the foundation.

No separate payment will be made to prepare the foundation area, the entire cost thereof to be included in the contract price for the specified fill.

5.5.2 Uncompacted Fill. Existing trees, brush, down timber, and other obstruction to placing the fill shall be removed or knocked down and spread in these areas, as approved by the Engineer. All foundation preparation work shall be considered as subsidiary work to the placement of the fill.

5.6 MATERIALS

5.6.1 General. The suitability of materials and their disposition in the fill will at all times be subject to approval by the Engineer. Mixing of materials during the excavation process at the borrow source may be required. Pockets of material of uniform particle size, such as sand, when encountered, shall be proportionally mixed with other material to obtain an acceptable fill material or shall be wasted when so directed by the Engineer.

All fill materials shall be obtained from required excavation, designated borrow areas or other approved borrow sources.

5.6.2 Compacted and Semi-Compacted Fill. Soil materials for compacted and semi-compacted fill shall be free of sod, brush, roots, and other perishable material. Compacted and semi-compacted fills will also be free of stones having a maximum dimension of more than six (6) inches.

5.6.3 Uncompacted Fill. Soil materials for uncompacted fill may contain sod, roots, brush, stones and other types of material. The amount and placement location of such materials shall at all times be subject to approval by the Engineer.

5.6.4 Backfill. Backfill material shall be the type and quality conforming to that specified for the adjoining fill material, except that no stones with a dimension of more than three (3) inches will be placed within two (2) feet of a structure.

5.7 PLACEMENT AND SPREADING

5.7.1 General. No fill material shall be placed until the foundation, subgrade, and/or cutoff trench areas have been inspected and approved by the Engineer. The contractor shall dewater the foundation, subgrade, and/or cutoff trench before any fill material is placed. During construction, the top surface of all earth fills shall be kept crowned with grades of not less than two (2) percent in order that the fill will drain freely towards the slopes.

No fill shall be placed upon a frozen surface, nor shall snow, ice, or frozen material be incorporated in the fill.

Unless otherwise directed, the fill shall be maintained at approximately the same level regardless of the number of types of materials being placed, except that rock fills and filter blankets shall be so placed as to prevent mixing of earth fill material with filter blanket and/or rock materials.

The Contractor shall construct the fill in approximately horizontal lifts extending the entire length of the fill unless notified in writing by the Engineer that the construction of the fill in sections is permitted. The lengths of the sections and the end slopes will be determined by the Engineer where operations are not continuous throughout the entire length of the fill.

5.7.2 Compacted Fill. The distribution of materials throughout a fill shall be such that there will be no lenses, pockets, streaks or layers of material differing substantially in texture or gradation from the surrounding material in the fill. After placement, the fill materials will be spread by motor grader or other approved equipment. The thickness of the layers before compaction with rollers shall not be more than eight (8) inches. No material placed in the fill by dumping in piles or windrow shall be incorporated in a layer in that position, but shall be moved and spread by blading or similar approved methods.

5.7.3 Semi-Compacted Fill. The distribution of materials throughout a fill shall be such that voids will be held to a minimum. The materials will be placed and spread in such a manner as to thoroughly mix the materials so that they will be reasonably well graded. After placement the fill materials will be spread by a grader or other approved equipment to a thickness not greater than the dimension of the largest component of the material in the lift or not more than eight (8) inches if the largest material is eight (8) inches or less.

5.7.4 Uncompacted Fill. Uncompacted fill material may be placed in any conventional manner. All roots, brush, stumps, stones and similar material shall be placed a minimum of two (2) feet below the elevation of the finished grade. The final grade of the filled area shall be smooth and blend with the surrounding topography.

5.7.5 Backfill. Backfill material shall be placed and spread in layers not more than four (4) inches thick before compaction.

No backfill or other load shall be placed against or on top of concrete surfaces before expiration of the minimum period indicated below unless approved in advance by the Engineer.

Walls and Vertical Faces	7 days
Conduit (Inside forms in place)	7 days
Cradle or Bedding	2 days

Subsequent to the number of days indicated above, but prior to fourteen (14) days after placing concrete, backfill operations may be initiated. During this period backfill may be placed against and on top of concrete surfaces, if compaction is accomplished by power tampers, to a depth or thickness not to exceed two (2) feet unless approved otherwise in advance by the Engineer. Hauling and rolling equipment will not pass over the top of the structure prior to the elapse of the total curing period of fourteen (14) days unless approved in advance by the Engineer. At no time will hauling and rolling equipment be permitted to pass within two (2) feet, horizontally or vertically, of the structure or any part thereof. Backfill over and around structures shall be brought up uniformly on all sides.

5.8 MOISTURE CONTROL

5.8.1 Compacted Fill. During the compaction operations the abutments at the level of the fill surface, the surface of the fill and the materials being placed shall be maintained within the moisture content range required to permit proper compaction to the specified density with the equipment used. The moisture content shall be controlled in the following manner.

Water may be added to the fill materials in the borrow areas or after the material has been brought onto the fill, whichever is the most practical. When material deposited on the fill is too dry, the Contractor shall be required to sprinkle each layer and obtain uniform moisture distribution in the layer by disking, blading or other approved methods. The amount of water applied shall be controlled so that free water will not appear on the surface during or subsequent to compaction operations.

When either the previously compacted lift or the material deposited on the fill is too wet it shall be removed or spread and permitted to dry, assisted by disking or blading, if necessary, until the moisture content is reduced to the specified limits.

When the top surface of a partial fill becomes too dry or compacted to permit suitable bond with the subsequent layer, the Contractor shall loosen the dried material by scarifying or disking. He shall then moisten the loosened material to an acceptable moisture content and recompact the material to the specified density.

Adjustments of moisture content will be made on the basis of determinations of moisture content by field tests as construction progresses.

5.8.2 Semi-Compacted Fill. The cohesive portion of the fill material shall have a moisture content such that when kneaded in the hand it will form a ball, which does not readily separate when struck sharply with a pencil or which refuses to separate when pressed between the hands. The Contractor may be required to wet or dry the material to obtain the above specified moisture content. When cohesionless material is used no limit will be placed on the moisture content.

5.8.3 Uncompacted Fill. No limit will be placed on the moisture content of uncompacted fill materials except in the event the water content causes deformation of the fill.

5.8.4 Backfill. Backfill materials shall contain the moisture which will permit compaction to the required density as specified in 5.4.2.

5.9 COMPACTION

5.9.1 Equipment. The Contractor shall furnish and operate the necessary types and kinds of equipment to perform the operations required to obtain the compaction specified herein for the type and class of fill included in the contract. The equipment shall be of the capacity, weight and/or power necessary to perform the required operations in a workman-like manner and produce satisfactory progress in construction.

5.9.2 Compacted Fill. After each layer of fill material has been placed, spread and contains the required moisture content specified in 5.8.1, it shall be compacted by passing a roller over the entire surface of the layer a sufficient number of times to obtain the density specified for that particular class of compacted fill.

Portions of the fill which are not accessible to the roller shall be placed in four (4) inch layers and compacted with power tampers to a density equal to that required for other portions of the fill. Densities of compacted fill will be determined by comparing field densities to densities obtained by compacting the same type of soil by "Modified A.A.S.H.O." tests for "Compacted Fill, Class A." or "Proctor" tests for "Compacted Fill, Class B." In no case shall the field densities be less than the required percent of the maximum dry density value as specified in Paragraph 5.4.2 of this specification.

5.9.3 Semi-Compacted Fill. After each layer of fill material has been dumped, spread, and blended, and the moisture content is in accordance with the provisions of 5.8.2, compaction will be obtained by the method specified in Paragraph 5.4.3. The acceptability of "Semi-Compacted Fill" will be based on adherence to the specified procedure.

5.9.4 Uncompacted Fill. No compaction is required other than that obtained by placing, spreading, and dressing the surface area.

5.9.5 Backfill. After each layer of backfill material has been placed and the moisture content is in accordance with the provisions of Paragraph 5.8.4, it shall be compacted with power tampers to the same density requirements as specified in 5.4.2.

5.10 MEASUREMENT AND PAYMENT

All earth fill will be measured between (1) the foundation lines as determined by a cross-section survey after accomplishment of the foundation preparation, scarifying and making any excavation in the embankment foundation area; and (2) the line, grades and slopes of the fill as shown on the drawings or as staked in the field.

Each type of fill will be measured between the type of fill lines as shown on the drawings or as otherwise established. No measurement will be made of additional fill resulting from above-grade tolerance permitted. The volume of each type of fill will be computed to the nearest cubic yard by the method of average cross-sectional end areas. Payment for each type of fill shown in the bid schedule will be made at the contract unit price for that type of fill.

Backfill will be paid for at the contract unit price for compacted fill.

When uncompacted fill is shown on the drawings but not listed in the bid schedule, it will not be paid for as fill but will be handled under Specification 4-58, Excavation.

The payment as specified above shall be considered full compensation for all labor, materials, equipment and incidentals necessary to perform all the operations specified herein.

8A - CONCPETE**8A.1 SCOPE**

This specification covers the quality of concrete, the forming, placing, curing and other requirements for concrete construction.

8A.2 COMPOSITION

Concrete shall be composed of cement, fine and coarse aggregates, water and, when specified on the drawings, admixtures other than air entrainment. The material shall meet the requirements of Construction Material Specification 100-58, 101-58, 102-58, and 104-58, respectively. All concrete shall be air-entrained by use of either air-entrained cement or an air-entraining admixture.

8A.3 CLASSIFICATION

Concrete shall be designated on the drawings and/or in the bid schedule as Class A, B, or C and Types I, II, or III, as defined below.

The basis for "Class" of concrete shall be the minimum compressive strength at twenty-eight (28) days, as listed below:

<u>Class</u>	<u>28 Day Compressive Strength lbs. Per Square Inch</u>
A	3750
B	3000
C	2500
D	2000

The basis for "Type" of concrete shall be its difficulty in forming and placing as stated below:

Type I concrete is intended for use in all heavily reinforced sections which require accurate forming and placement is difficult.

Type II concrete is intended for use in lightly reinforced sections where forming need not be precise and placement may not be difficult.

Type III concrete is intended for use in sections which are not reinforced and placement may not be difficult.

8A.4 QUALITY OF CONCRETE

8A.4.1.Control. The Contractor shall be responsible for the design of the concrete mixtures and the quality of the concrete. Prior to any concrete construction or any change in the mix during construction, the Contractor shall furnish a statement to the Engineer giving the proportions by dry weight of cement, fine and coarse aggregate, and quantities of admixtures and water that will be used in the manufacture of each class of concrete contained in the contract. The Contractor shall also submit to the Engineer, laboratory tests made in accordance with paragraph 8A.5 of compressive strength determined by ASTM Designation C 39 at least 10 days before placement of concrete begins..

When truck mixers are used, the Contractor shall submit with each mixer-load a certified delivery ticket giving the quantities of cement, fine aggregate, coarse aggregate, admixtures and water contained in the batch.

8A.4.2.Measurements.. All materials entering into the concrete shall be mechanically measured by weight except the air-entraining admixture and water which may be measured by volume.

8A.4.3.Aggregate Content. Concrete mixtures will be designed to use the maximum size of coarse aggregate of $1\frac{1}{2}$ inches unless otherwise specified in the drawings.

8A.4.4.Entrained Air Content. The air content shall be between three (3) and six (6) percent of the volume of the concrete.

8A.4.5.Water Content. The water content of all concrete mixtures will be the minimum necessary to properly place the mixture being used.

8A.5 STRENGTH TESTS

Standard tests of the strength of the concrete may be made by the Engineer at any time he elects to do so. Samples of concrete will be obtained in accordance with the "Standard Method of Sampling Fresh Concrete", ASTM Designation C 172. Compression test specimens will be made in accordance with the "Standard Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field", ASTM Designation C 31. Compression tests will be made in accordance with the "Standard Method of Test for Compressive Strength of Molded Concrete Cylinders", ASTM Designation C 39.

For a 28-day strength test, three (3) standard test specimens shall be made from a composite sample of concrete taken from the transportation unit at the point of discharge. The test result shall be the average of the strengths of the three specimens, except that, if one specimen in a test shows manifest evidence of improper sampling, molding, or testing, it shall be discarded and the remaining two strengths averaged. Should more than one specimen representing a given test show definite defects, due to improper sampling, molding or testing, the entire test shall be discarded.

The Engineer will ascertain and record the batch number for the concrete and the exact location in the work at which each batch represented by a strength test is deposited.

8A.7 CONSISTENCY

The consistency of any concrete shall be such that it can be worked readily into the corners and angles of the forms and around reinforcement with the method of placing employed on the work, but without permitting the materials to segregate or excess free water to collect on the surface. The following ranges represent the extreme limits of allowable slump when tested in accordance with the "Test for Slump of Portland Cement Concrete", ASTM Designation C-143.

<u>Class of Concrete</u>	<u>Slump Range (Inches)</u>
Class A	1- $\frac{1}{2}$ to 3
Class B	1- $\frac{1}{2}$ to 4
Class C	1- $\frac{1}{2}$ to 4
Class D	1- $\frac{1}{2}$ to 6

8A.8 BATCHING AND MIXING

8A.8.1. Equipment. If the concrete is batched and mixed at the site, the Contractor shall provide a modern and dependable batch-type mixing plant with a capacity consistent with the size of the job. The equipment shall be capable of combining the aggregate, cement and water into a uniform mixture and of discharging this mixture without segregation. Adequate facilities shall be provided for the accurate measurement and control of each of the materials entering the concrete. The complete plant assembly shall include provisions to facilitate the inspection of all operations at all times.

Ready-mixed concrete may be used if approved by the Engineer. All mixing requirements specified herein for concrete mixed at the site shall be applicable to ready-mixed concrete. The Engineer shall have free access to the mixing plant at all times.

Truck mixers will be allowed, provided the use of this method will cause no violation of any applicable provisions of specifications for concrete contained herein. Truck mixers, unless otherwise authorized by the Engineer, shall be of the revolving drum type, water-tight, and so constructed that the concrete can be mixed to insure the uniform distribution of materials throughout the mass. Each truck mixer shall be equipped with a tank of known capacity which shall be equipped with an accurate device for measuring the amount of water added. Truck mixers and agitators shall be operated within the limits of capacity and speed of rotation designated by the manufacturer of the equipment.

8A.8.2. Mixing Time. Neither the speed nor the volume capacity of the mixer shall exceed those recommended by the manufacturer. Excessive overmixing, requiring additions of water to preserve the required consistency will not be permitted. The mixing time for each batch, after all solid materials are in the mixer drum, provided that all the mixing water shall be introduced before one-fourth ($\frac{1}{4}$) of the mixing time has elapsed, shall be no less than 1- $\frac{1}{2}$ minutes for mixers having capacity up to two (2) cubic yards. For mixers of larger capacities, this minimum shall be increased fifteen (15) seconds for each cubic yard or fraction thereof of additional capacity. When a truck mixer is used, each batch of concrete shall be mixed not less than fifty (50) nor more than one hundred (100) revolutions at a mixing speed of not less than four (4) r.p.m. after all materials are in the mixer drum.

8A.9 CONVEYING

Concrete shall be conveyed from mixer to forms as rapidly as practicable by methods which will prevent segregation or loss of ingredients. There shall be no vertical drop greater than five (5) feet except where suitable equipment is provided to prevent segregation and where specifically authorized.

No concrete shall be placed until the Engineer has given his approval of the subgrade, forms and reinforcing steel in place. No concrete shall be placed except in the presence of the Engineer and the Contractor shall give reasonable notice of his intention to pour.

8A.10 PLACING

8A.10.1 General. All concrete will be placed in forms in accordance with Section 8A.15 of this specification. Concrete shall be worked into the corners and angles of the forms and around all reinforcements and embedded items without permitting the materials to segregate. Concrete shall be placed within one (1) hour after the introduction of the water to the cement and aggregates. Concrete shall be deposited as close as possible to its final position in the forms. The depositing of concrete shall be regulated so the concrete may be effectively compacted with a minimum lateral movement. Concrete shall be consolidated with the aid of mechanical vibrating equipment supplemented by hand-spading and tamping. Vibrating equipment shall be of the internal type and shall at all times be adequate to properly consolidate all concrete. All concrete placing equipment and methods shall be subject to approval of the Engineer.

8A.10.2. Lifts in Concrete. Unless otherwise shown on the drawings, the permissible depth of concrete placed in each lift shall not be limited. All concrete shall be deposited in horizontal layers approximately twenty (20) inches in thickness unless otherwise authorized or directed. Each layer shall be well worked into the preceding layer while both are still soft. If a delay occurs in excess of a forty (40) minute interval between any two (2) consecutive batches or loads, or in case of any delay between placing

of batches that allows previously placed concrete to take initial set, the Contractor shall discontinue the placing of concrete and make, at his own expense, a construction joint satisfactory to the Engineer before proceeding with the placing operations. He shall remove whatever portion of the previously placed concrete that is deemed necessary for the proper formation of the construction joint and no payment shall be made to the contractor for the concrete removed.

8A.10.3 Concrete on Rock Foundation. Rock surfaces upon which concrete is to be placed shall be clean, free from oil, standing or running water, mud, objectionable coatings, debris, loose semi-detached or unsound rock or fragments. Faults or seams shall be cleaned to a depth satisfactory to the Engineer and to firm rock on the sides. Immediately before concrete is placed, all rock surfaces shall be cleaned thoroughly by water under pressure, wet sandblasting, or other means satisfactory to the Engineer. All rock surfaces shall be kept continuously wet for twenty-four (24) hours immediately prior to placing concrete.

8A.10.4. Concrete on Earth Foundations. Unless otherwise authorized, all concrete shall be placed upon clean, damp surfaces free from frost, ice, standing or running water, and never upon soft mud, dried porous earth, or upon fill until specified compaction as shown on the drawings has been obtained.

8A. 10.5. Placing Temperature. Concrete, when deposited in the forms during cold weather, shall have a temperature of not less than 40°F. nor more than 80°F. Heating of mixing water or aggregates will not be permitted until the temperature of the concrete has decreased to 45°F. The materials shall be free from ice, snow, and frozen lumps before entering the mixer. All methods and equipment shall be subject to approval.

8A.11 CONSTRUCTION JOINTS

The placing of concrete will be accomplished so that construction joints occur at locations shown on the drawings or as approved by the Engineer. The type of construction joint will be shown on the drawings. As a lift is completed, the top surface shall be immediately and carefully protected from any condition that will adversely affect the hardening of the concrete. Joints shall be clean and kept damp until the new concrete is placed. Prior to placing the next lift, the joint shall be prepared by brooming a bedding layer of mortar of the same mix as that in the concrete into the old surface after it has been kept moist for several hours unless otherwise permitted.

8A.12 EXPANSION OR CONTRACTION JOINTS

8A.12.1. General. Joints shall be provided at the location indicated on the drawings and according to the details shown or as otherwise approved. The methods and materials used shall be subject to approval and the materials shall conform to the specification applicable. In no case shall any fixed metal, embedded in concrete, be continuous through an expansion or contraction joint, except as specifically detailed in the drawings.

8A.12.2. Expansion Joint Filler. Where indicated on the drawings, expansion joint filler shall be installed using materials of the type and quality indicated and in accordance with Specification No. 106-58, Expansion Joint Filler.

8A.12.3. Waterstops. Waterstops shall be installed in joints as shown on the drawings or as otherwise directed. All joints in metal waterstops shall be brazed or welded. Joints in rubber waterstops shall be cemented or vulcanized as recommended by the manufacturer. Adequate provisions shall be made to support and completely protect the waterstops during progress of the work. The Contractor shall replace or repair, at his own expense, any waterstops punctured, ruptured, or otherwise damaged before final acceptance of the work. Materials from which waterstops are made will be in accordance with Specification No. 107-58, Waterstops.

8A.13. FINISHING

Defective concrete, honeycombed areas, voids left by the removal of tie rods, ridges on all concrete surfaces permanently exposed to view or exposed to water on the finished structure, shall be repaired immediately after the removal of forms unless otherwise authorized or directed. Voids left by removal of tie rods shall be reamed and completely filled with dry-patching mortar. Defective concrete shall be repaired by cutting out the unsatisfactory material and placing new concrete which shall be secured with keys, dovetails, or anchors. Excessive rubbing of formed surfaces will not be permitted. All unformed surfaces of concrete, exposed in the completed work, shall have a wood float finish without additional mortar.

8A.14 CURING AND PROTECTION

. General. All concrete shall be cured for a period of not less than seven (7) consecutive days by one or a combination of the following methods. The curing process shall be done so as to prevent loss of moisture from the concrete for the duration of the entire curing period. Unhardened concrete shall be protected from heavy rains and flowing water. All concrete shall be adequately protected from damage.

8A.14.2. Moist Curing. Concrete shall be moist cured by maintaining all surfaces continuously (not periodically) wet for the duration of the entire curing period. Water for curing shall be clean and free from any elements which will cause staining or discoloration of the concrete. Where forms of wood are used and left in place during curing, the wood shall be kept wet at all times.

8A.14.3. Membrane Curing. The concrete may be cured with a curing compound of the surface membrane type in accordance with specification 105-88, Curing Compounds. Wood forms shall be kept wet until stripped. Formed surfaces shall be thoroughly moistened and the curing compound applied as soon as free water disappears. The curing compound may be applied to unformed surfaces as soon as free water has disappeared. The curing compound shall be applied in a two (2) coat continuous operation by approved spraying equipment and at a coverage of not more than two hundred (200) square feet per gallon for both coats. The second coat shall be applied to overlap the first coat in a direction at approximately right angles to the direction of the first application. Concrete surfaces which are subjected to heavy rainfall within three (3) hours after the curing compound has been applied shall be resprayed by the method and at the coverage herein specified. All concrete surfaces on which the curing compound has been applied shall be adequately protected for the duration of the entire curing period from any damage that would disrupt the continuity of the curing membrane.

8A.14.4. Cold Weather. The air and forms in contact with the concrete shall be maintained at temperatures above forty (40) degrees for at least five (5) days and at a temperature above freezing for the remainder of the specified curing period. Concrete, permitted to be cured with curing compounds, shall be provided the same protection against freezing and low temperatures as provided herein. No open fire shall be permitted within two feet of the concrete at any time.

8A.15 FORMS

8A.15.1. Material. Forms shall be of wood, steel or other approved material, except that natural earth, compacted fill or rock may be used as forms when shown on the drawings or when designated by the Engineer. The type, size, shape, quality and strength of all materials of which forms are made will be subject to approval of the Engineer.

8A.15.2. Construction. Forms shall be true to line and grade, mortar-tight and sufficiently rigid to prevent objectionable deformation under load. The form surfaces shall be smooth, free from irregularities, dents, sags or holes when used for permanently exposed faces. Exposed joints, edges, and external corners shall be finished as indicated on the drawings. Bolts and rods used for internal ties shall be so arranged that when the forms are removed, metal will not be less than one (1) inch from any concrete surface. Wire ties will not be permitted except when approved in writing. When natural earth, compacted fill or rock are to be used as forms, excavation must extend at least 2.5 inches outside the neat lines of the structure.

8A.15.3. Coating. Forms for exposed surfaces shall be coated with an approved non-staining form oil which shall be applied shortly before the concrete is placed. After oiling, surplus oil on the form surfaces and any oil on the reinforcing steel or other surfaces requiring bond with the concrete shall be removed. Forms for unexposed surfaces may be thoroughly wetted in lieu of oiling immediately before the placing of concrete, except that in freezing weather oil shall be used.

8A.15.4. Removal. Forms shall not be removed without approval of the Engineer. All form removal shall be accomplished in such a manner as to prevent injury to the concrete. Forms will not be removed before the expiration of the minimum time indicated below except where otherwise directed or specifically authorized.

Arches, beams and deck-type slabs	7 days
Column and walls	24 hours
Conduits in open cut	72 hours

When conditions on the job are such as to justify the requirement, forms will be required to remain in place for longer periods.

8A.16 EMBEDDED ITEMS

Before concrete is placed, all embedded items will be firmly and securely fastened in place as indicated on the drawings or as required. Embedded items shall be free of oil and other foreign matter.

8A.17 MEASUREMENT AND PAYMENT

Measurement of concrete will be made on the basis of the actual volume of concrete within the neat lines of the structure as indicated on the drawings, or as directed, and will be computed to the nearest one-tenth (1/10) cubic yard. Measurement of concrete placed against the sides of an excavation without the use of intervening forms will be made only within the neat lines of the structure as shown on the drawings and as otherwise authorized in writing. No deductions will be made for rounded or beveled edges or for voids or embedded items which have an internal diameter of six inches or less.

Payment for each class and type of concrete will be made at the contract unit price listed in the bid schedule for each class and type of concrete. Such payment shall be considered full compensation for all labor, materials, equipment and incidentals necessary for the completion of the work specified herein. The furnishing and placing of reinforcing steel is not a part of this specification but will be paid for as specified in Construction Specification 9-58, Placing Steel Reinforcement.

CONSTRUCTION SPECIFICATIONS9 - PLACING STEEL REINFORCEMENT9.1 SCOPE

This specification covers cutting, bending and placing steel reinforcement in concrete including bar and mesh reinforcement.

9.2 GENERAL

The reinforcement material shall meet the requirements of construction Material Specification 103-58, Steel Reinforcement.

9.3 BENDING

Reinforcing bars may be mill or field bent. All bends shall be made in accordance with standard approved practice and by approved machine methods. All bends shall be made without heating.

9.4 SPLICING

The length of splices of reinforcing bars shall be as shown on the drawings. When not shown on the drawings, the length of splices shall equal thirty (30) diameters of the smaller bar being spliced. Mesh reinforcement shall be spliced by lapping six (6) inches or two (2) meshes, whichever is greater, and the lapped ends shall be securely wired or clipped together with standard clips.

9.5 SUPPORTS

All reinforcing material shall be secured in place by use of approved metal or concrete supports, spacers and ties. The reinforcing material will be so supported and tied together that it will remain in place throughout the concreting operations. The supports, spacers and ties shall be of a type and used in such a manner that they will not be exposed or contribute in any way to the discoloration or deterioration of the finished concrete surfaces.

9.6 PLACING

When placed and just prior to the concreting operations, all reinforcing material shall be free of loose flaky rust and scale, oil, grease or other coating which might destroy or reduce its bond with concrete. No reinforcing material shall be placed until the subgrade has been approved by the Engineer. No concrete for a pour shall be placed until the placement of the reinforcing material has been inspected and approved for that pour by the Engineer.

9.7 MEASUREMENT AND PAYMENT

The quantity of bar reinforcement will be measured in linear feet for each nominal size as shown on the drawings or otherwise directed for placement. The computed weight of reinforcing bars to be paid for will be based on the unit weights shown in Table 1 of ASTM Designation A-15. The total weight will be computed to the nearest pound. Additional steel reinforcing for laps authorized for the convenience of the Contractor and all material used to fasten all of the reinforcing in place will not be included in the poundage for payment.

The quantity of steel mesh reinforcement shall be measured and computed to the nearest square foot as shown on the plans or otherwise directed for placement.

Payment for bar reinforcement will be made at the contract unit price per pound for Steel Bar Reinforcement.

Payment for mesh reinforcement will be made at the contract unit price per square foot for Steel Mesh Reinforcement.

Such payment or payments shall be considered full compensation for all labor, material, equipment and any incidentals necessary to place the reinforcement as specified herein and as shown on the drawings.

CONSTRUCTION SPECIFICATION

11 - PIPE CONDUITS - REINFORCED CONCRETE11.1 SCOPE

This specification covers the furnishing and installation of reinforced concrete pipe and fittings including cradling and jointing.

11.2 INSTALLATION

11.2.1 General. The pipes to be installed shall be as called for in the drawings and shall meet material specification 109-58, Concrete Pipe. All pipe shall be inspected for defects by the Engineer immediately prior to placing and shall be laid in his presence.

The contractor shall be required to furnish equipment to apply longitudinal pressure to the pipe in order to secure a tight joint. Such equipment shall be so designed and used that no damage will occur to the pipe joints previously constructed.

11.2.2 BEDDING

(a) Concrete Cradles. The quality, forming, placing and curing of concrete in the cradle shall conform to specification 8A-58, Concrete. The portion of the exterior surface of the pipe that will be in contact with the cradle shall be carefully cleaned with a wet brush immediately prior to placing the concrete. Pipes to be supported by the cradle or encased within it shall be supported by means of pre-cast of "poured in place" concrete blocks.

(b) Concrete Bedding. The bottom of the trench or excavation shall be shaped as shown on the drawings and concrete shall be thoroughly tamped, rodded, or vibrated around the bottom of the pipe.

11.2.3 JOINTING

All joints shall be sealed with a continuous ring rubber gasket supplied by the pipe manufacturer and installed in accordance with his recommendations. All pipe joints shall be inspected after installation and prior to placing any filler material to insure that gaskets are properly seated.

All surfaces which come in contact with rubber gaskets or joint sealing materials shall be cleaned and free from soil particles and all foreign material immediately prior to joining the pipe and placing filler materials.

The type of joint filler material to be used shall be specified on the drawing.

(a) When cement mortar is specified it shall consist of one part Portland cement to two parts clean sand and shall be applied within 30 minutes after mixing with water in a manner recommended by the Engineer. External mortar joints shall be cured in accordance with specification 8A-58, Reinforced Concrete.

(b) When jute and asphaltic joint compound are specified the jute shall be carefully packed around the joint near the rubber gasket with a packing tool to protect it from any possible contact with asphaltic joint compound. Each joint shall be inspected by the Engineer before placing the asphaltic joint compound in place.

11.2.4 ANTI-SEEP COLLARS. The quality, forming, placing and curing of concrete in the anti-seep collars shall conform to specification 8A-58 Concrete. The collar shall be constructed in such a manner that preformed expansion joint filler may be properly placed between the collar and the conduit and cradle to prevent bonding of any part of the anti-seep collar to the pipe or cradle.

11.2.5 WALL FITTING. A wall fitting of special design as shown on the drawings shall be installed in the wall of the riser during its construction to connect the reinforced concrete pipe to the riser.

11.3 MEASUREMENT AND PAYMENT

The method of payment for all concrete in concrete cradles, concrete bedding and anti-seep collars shall conform to specification 8A-58, Concrete.

The unit of measurement for reinforced concrete pipe shall be linear feet and tenths thereof of pipe in place measured along the centerline of the pipe between the upstream end of the special wall fitting in the riser and the shoulder of the male connection of the last pipe length downstream. Payment shall be made at the contract unit price per linear foot for Reinforced Concrete Pipe and shall be full compensation for all pipe, and elbows, special wall fittings, rubber gaskets, jointing materials, labor, equipment and incidental work required in the installation of the conduit.

13 - STRUCTURE DRAINAGE**13.1 SCOPE**

This specification covers the installation of foundation blanket drains, foundation trench drains, toe drains and wall drains.

13.2 DEFINITIONS

13.2.1 Foundation Blanket Drain. A foundation blanket drain consists of a layer of porous material, usually sand and gravel, spread over a portion of the foundation area of an embankment and may extend up the abutments.

13.2.2 Foundation Trench Drains. A foundation trench drain is a constructed trench that is backfilled or partially backfilled with porous material, usually sand and gravel. A trench drain may consist solely of porous material or it may also contain a porous or perforated pipe.

13.2.3 Toe Drain. A toe drain is located in the downstream toe of an embankment and may consist of rock and/or sand and gravel. A toe drain may consist solely of porous material or it may also contain a porous or perforated pipe.

13.2.4 Wall Drains. A wall drain consists of a porous material, usually sand and gravel, that is placed adjacent to a structure wall to collect and facilitate drainage through weep hole in the structure wall. A wall drain may or may not include a collector pipe.

13.2.5 Tile Drain. A tile drain consists of drain tile or perforated pipe placed in an excavated trench. The tile or pipe may be bedded in or backfilled with a porous material.

13.3 FILTER MATERIAL

Filter material shall be composed of tough, hard, durable rock or particles, shall be reasonably free from thin, flat, and elongated pieces. It shall be free of organic matter and soft friable particles in quantities considered objectionable. Filter material shall consist of well graded sand, sand and gravel, gravel, crushed rock, or rock and shall conform to the gradations or mixtures shown on the drawings or in the special specifications.

The Contractor shall designate to the Engineer the source of the filter material for his approval at least ten (10) days prior to the delivery of any such material to the site of the work.

13.4 INSTALLATION

13.4.1 General. If pipe within the drain is indicated on the plans, the pipe shall be placed in the filter material at the locations, elevations, lines or grades shown. The kind, diameter, length, strength or gage and coating of the pipe shall be in accordance with the drawings or special specifications.

The foundation area for the filter layers shall be shaped and dressed to the slope lines and grades shown on the drawings. No filter material shall be placed until the foundation area has been inspected and approved by the Engineer.

The filter material shall be placed to the neat lines shown on the drawings or as directed by the Engineer. The material shall be placed in such a manner as to avoid the segregation of particle sizes within the filter and to avoid mixing the filter material with the foundation material. Any damage to the surface of the foundation area during placement of the filter shall be repaired before proceeding with the work. Filter will be placed and finished to an even surface free of mounds and windrows. When compaction of these materials is required, it shall be indicated on the drawings.

The upper ends of all pipe in foundation drains shall be closed as shown on the drawings. If metal caps are used, the caps shall be so installed as to have a positive connection with the pipe to prevent its displacement during backfilling operations and thereafter. The outlet end of the pipe shall have an animal guard as shown on the drawings.

13.4.2 Corrugated Metal Pipe. The separate sections of pipe and fittings shall be joined firmly together with coupling bands held in place with bolts.

The coupling bands, elbows and tees shall be the same gage as the pipe with which they are used.

After the pipe, fittings and connections have been completely installed and while still exposed, any points where the bituminous coating has been broken sufficiently to expose the base metal shall be repaired by recoating with asphalt material similar and equal to that used in the original bituminous coating.

Perforated corrugated metal pipe shall be laid with the perforations down and symmetrical about a vertical centerline.

Just prior to the placement of the perforated pipe in its final position, the perforations (holes) shall be thoroughly cleaned by removing all excess material, bituminous and other, from each perforation.

When using standard corrugated metal pipe, the pipe shall be laid with the outside laps of circumferential joints pointing upstream, and with longitudinal laps on the sides.

When the drawings show standard or helical perforated corrugated metal pipe connecting with non-perforated standard or helical corrugated metal outlet pipe, a tee or elbow connection shall be provided and installed at the location shown on the drawing.

13.4.3 Fiber Pipe. Standard couplings shall be used to connect both the perforated and non-perforated fiber pipe.

13.4.4 Clay and Concrete Pipe. The pipe shall be laid with the bells pointing upstream to the direction of flow.

Perforated pipe shall be laid with perforations down and symmetrical about a vertical centerline. Perforated holes shall be thoroughly cleaned of mud or dirt before laying.

13.4.5 Blanket Foundation Drains and Toe Drains. Filter material used in blanket foundation drains or toe drains shall be placed in eight (8) inch deep horizontal layers. Each layer shall be consolidated by routing hauling equipment so that at least two-thirds of the surface area is traversed by the tires of the equipment or by two passes of a pneumatic roller. Areas of gravel inaccessible to large equipment shall be consolidated by manually operated pneumatic tampers or other means approved by the Engineer.

When rock is used in the toe drains, the material shall be placed in horizontal layers about twelve (12) inches thick and consolidated by the travel of hauling equipment over each layer.

13.4.6 Foundation Trench Drains. The filter material shall be placed in the trench by methods that will eliminate mixing earth with the filter material.

When the top of the foundation trench drain is below the ground line, the Contractor shall backfill the trench to the ground line with the class of embankment shown on the drawings. Payment will not be made for this backfill as such but shall be considered a subsidiary of this specification.

13.4.7 Wall Drains. A piece, one (1) foot square, of four by four (4x4) hardware cloth, sixteen (16) square openings to the square inch, manufactured with twenty-three (23) gage galvanized wire shall be furnished and placed between the porous gravel filter material and each weep hole where porous concrete material is not called for on the drawings.

If porous concrete is called for, the concrete material shall consist of coarse aggregate retained on a No. 4 sieve, cemented together with neat cement forming a rigid and porous drain. This material shall be placed at weep holes if so indicated on the drawings.

13.5 MEASUREMENT AND PAYMENT

The volume of filter material placed will be determined by the method of average end areas. End areas of sections shall be computed as follows: Surveys will be made after the foundation is prepared and prior to placement of materials. The areas will be computed using the survey of the prepared foundation and the neat lines of filter material indicated on the drawings, or as modified by the Engineer.

Payment for filter material will be made at the contract unit price per cubic yard for "Filter Material." Payment for pipe will be made at the contract unit price per linear foot for the corresponding type, kind, size and grade of pipe as listed in the bid schedule. Such payment shall be full compensation for all labor, materials, equipment, and incidentals required to construct the drains as shown on the drawings and specified herein, including the required excavation and backfill.

CONSTRUCTION SPECIFICATION14 - METAL FABRICATION AND INSTALLATION14.1 SCOPE

This specification shall apply to furnishing material, fabrication, installation and painting of all metal structures in accordance with the plans including the metal part of composite structures involving other materials, except steel reinforcing bars. Typical structures covered under this specification are Trash Racks, Manhole Assemblies, etc.

14.2 MATERIALS

All structural shapes, rods, and plates shall be of structural steel or wrought iron, as specified or indicated on the drawings, meeting the respective requirements prescribed under 112-58, Wrought Iron and Steel Pipe and Fittings, Specification 117-58, Structural Metal. When galvanizing is specified on the drawings it shall be done as prescribed in Specification 119-58, Galvanizing.

14.3 WORKMANSHIP AND FINISH

The workmanship and finish shall be first class and equal to the best practice in modern metal fabrication shops. Welding, shearing, burning and chipping shall be neatly and accurately done and all portions of the work exposed to view shall be neatly finished.

14.4 BOLTED CONNECTIONS

Bolted connections shall not be used unless shown on the plans. Holes shall be drilled 1/16 inch larger than the nominal diameter of the bolts unless otherwise specified. Holes shall be at right angles to the surface of the metal so that both head and nut will bear squarely against the metal. When bolts are to be used in beveled surfaces, beveled washers shall be provided to give full bearing to the head or nut.

Bolts shall extend entirely through their nut but not more than one-fourth (1/4) inch beyond after the nuts are tightened.

14.5 RIVETED CONNECTIONS

Pneumatic hammers shall be used for field riveting except when the use of hand tools is permitted. Rivets larger than 7/8 inch in diameter shall not be driven by hand.

Connections shall be accurately and securely fitted before the rivets are driven. Light drifting will be permitted to draw the parts together. In driving, rivets shall be upset to completely fill the holes. Rivets shall be tight and grip the connecting parts securely together.

14.6 WELDING

Welding shall be done only where called for on the drawings. Welding will not be accepted as a substitute for riveting or bolting. All welding shall be done by qualified welders.

Each welded joint shall be electric arc welded with one-fourth (1/4) inch fillet, butt or bend welds.

Welding electrodes shall comply with the requirements of the Standard Specifications for Mild Steel Arc-Welding Electrodes, ASTM Designation A-233, except that they shall be uniformly and heavily coated (not washed) and shall be of such nature that the coating will not chip or peel while being used with the maximum amperage specified by the manufacturer.

In welding metal which is to be galvanized, bare electrodes shall be used, unless otherwise specified.

All aluminum welds shall be made with welding rods conforming to the requirements of Federal Specification QQ-R-566 for Rods, Welding, Aluminum and Aluminum Alloys Type I, Class FS-RAI-43.

14.7 PAINTING

Unless galvanized or otherwise specified on the drawing, all steel shall be painted with three (3) coats of commercial grade paint. The first coat shall be of red-lead paint. The second coat shall be of red-lead paint, tinted light brown with lamp-black in an amount not more than one-fourth (1/4) pound per gallon of linseed oil. The third coat shall be of aluminum paint.

Immediately prior to the application of the first coat of paint, the surfaces of metal to be painted shall be thoroughly cleaned, removing rust, loose mill scale, dirt, oil or grease and other foreign substances and shall be dry.

Prior to the application of the second and third coats, the paint shall be dry and hard and shall be cleaned of all dirt, oil and grease and shall have a dry surface.

The paint shall be thoroughly mixed or stirred immediately before applying in order to keep the pigments in uniform suspension.

The coating of paint applied shall be smoothly and uniformly spread so that no excess paint will collect at any point. On all surfaces which are inaccessible for paint brushes the paint shall be applied by spraying or by sheepskin daubers. If the painting is unsatisfactory to the Engineer, the paint shall be removed and the metal thoroughly cleaned and repainted.

Paint shall not be applied when the air temperature is below forty (40) degrees F. or when the air is misty, or when, in the opinion of the Engineer, conditions are otherwise unsatisfactory for the work.

It shall not be applied upon damp or frosted surfaces.

Material painted under cover in damp or cold weather shall remain under cover until dry or until weather conditions permit its exposure in the open. Painting shall not be done when the metal is hot enough to cause the paint to blister and produce a porous paint film.

14.8 MEASUREMENT AND PAYMENT

Payment for fabrication and installation of metal work will be made at the contract lump sum prices. Such payment shall include full compensation for furnishing all material, fabricating, painting, erecting and incidental work necessary to the installation of the finished metal work in place.

CONSTRUCTION SPECIFICATION17 - ROCK RIPRAP17.1 SCOPE

This specification covers the foundation preparation and placing of rock riprap.

17.2 GENERAL

When filter blankets are required they will be shown on the drawings and shall conform to Specification 7-58, Filters.

17.3 MATERIALS

The riprap stone shall be durable and of a suitable quality to assure permanence in the climate in which it is to be used. The stone shall be sound and dense, free from seams of soft materials and other defects that would tend to increase deterioration from weathering, freezing, and thawing, or other natural causes. Riprap shall be reasonably well graded from the minimum size to the maximum size stone as shown on the drawings. Rock fragments or spalls shall be used to fill the voids between the larger rocks.

The inclusion of appreciable quantities of dirt, sand, clay and rock fines will not be permitted. All rock considered for use as riprap shall have prior approval by the engineer before delivery to the site.

17.4 CONSTRUCTION

17.4.1 Foundation Preparation. Earth surfaces on which the filter blanket or rock riprap is to be placed shall be trimmed and graded to conform to the lines of sections shown on the drawings. Prior to placing the rock riprap, the prepared earth foundation will be inspected, and no materials shall be placed thereon until approved by the engineer.

17.4.2 Riprap. Dumped riprap composed of stone conforming to the requirements of this specification will be placed by equipment on the surfaces and to the depths indicated on the drawings or as staked on the ground. The riprap shall be placed to the full course thickness at one operation and in such manner as to avoid serious displacement of the underlying materials. The riprap shall be delivered and spread so that the mass of stones in place shall be reasonably well graded, with the larger rocks uniformly distributed and the smaller rocks and spalls filling the voids between the larger rocks. The finished riprap shall be free from objectional concentrations of large or small stones. A tolerance of +12 inches or -6 inches from slope lines and grades shown on

the drawings shall be allowed in the finished surface of the riprap, except that the extreme minus tolerance shall not be continuous over an area exceeding 200 square feet. Placing riprap by dumping into chutes or by other means that are likely to cause segregation of the various sizes will not be permitted. The contractor shall maintain the riprap protection until it has been accepted, and any materials displaced by any cause shall be replaced at the contractor's expense to the lines and grades shown on the drawings.

When hand-placed riprap is called for on the drawings, riprap composed of stone conforming to the requirements of the specification shall be placed by hand on the surfaces and to the depths indicated on the drawings or as staked on the ground. The riprap shall be placed in such manner that adjacent stones are in close contact and in general have the greatest dimension across the slope. Spaces between the larger stones shall be filled with the smaller stones of acceptable size. The smaller stones shall not be grouped to serve in place of the larger size stone. Flat slab rocks shall be laid on edge. A tolerance of +12 inches or -6 inches from the slope lines and grades shown on the drawings will be allowed in the finished surface of the riprap, provided the minus tolerance is not continuous over an area greater than 200 square feet.

17.5 MEASUREMENT AND PAYMENT

The work will be measured by the actual number of square yards, to the nearest one-tenth (1/10) sq. yd. measured in place parallel to the face of the riprap as indicated on the drawings. Payment will be made at the contract unit price per square yard for riprap, and shall be considered full compensation for all labor, material, equipment and incidentals necessary for the completion of the work specified herein.

When "Rock Riprap" is not shown as a separate item in the contract, the price for such work specified herein shall be a subsidiary of the other items and no separate payment will be made for "Rock Riprap" as such.

CONSTRUCTION SPECIFICATION18 - GATES AND VALVE INSTALLATION18.1 SCOPE

This specification covers the installation of valves and gates, including hoists, rods, seals and other appurtenant apparatus necessary to their installation and operation.

18.2 VALVES, GATES AND HOISTS

Valves, gates, hoists and other appurtenances shall be equal to the manufacturer's model or models designated on the drawings and shall comply with the style, size, strength (working head and seating pressure), shape and end connection shown on the drawings. They shall be an approved standard product from a reputable manufacturer and shall be manufactured to the standards of commercial equipment to facilitate assembly, installation, repair and replacement. The gates and hoists shall be completely assembled in the factory and shall be dismantled only as required for shipment. Where necessary to facilitate assembly in the field, they shall be marked and match-marked, and erection diagrams and templets for anchor bolts shall be furnished. All gates shall be supplied complete with all necessary lifting devices for the operation of the gates unless indicated otherwise on the drawings. The slide gates and flap gates shall be supplied attached to corrugated metal pipe or provided with anchor bolts for attachment to the inlet in accordance with the drawings. Appurtenances required in this installation such as encasement pipe, metal work, etc. not usually associated with a manufacturer's model will be shown on the drawings and shall meet the applicable specification such as specification No. 112-58, Wrought Iron, Steel, Cast Iron and Copper Pipe and fittings; No. 117-58, Structural Metal, and No. 119-58, Galvanizing.

Painting of galvanized and non-ferrous metal surfaces will not be required. All other surfaces of valves, gates, hoists and appurtenant metal work shall be painted one shop coat at the factory. The shop coat shall be in accordance with the manufacturer's standard practice for painting.

18.3 INSTALLATION

Valves, gates and appurtenances shall be carefully installed in conformance with the manufacturer's instructions and as shown on the drawings. Surfaces of all metal against which concrete will be poured shall be unpainted and free from all oil, grease, dirt, loose mill scale and flaky rust. Two additional coats of paint in addition to the shop coat shall be applied in the field in accordance with the specification for painting in Specification 14-58, Metal Fabrication and Installation.

18.4 MEASUREMENT AND PAYMENT

The unit of measurement for valves, gates and their appurtenances will be the number of each type, size and model designation. Payment will be made at the contract unit price for each type, size and model designation of valves, gates and their appurtenances, (including encasement pipes, or other items), shown on the drawings and listed in the bid schedule.

Such payment shall be considered full compensation for all labor, materials, equipment and any incidentals required to install the gates and valves and their appurtenances as shown on the drawings and specified herein.

CONSTRUCTION SPECIFICATION20 - SALVAGING AND PLACING TOPSOIL20.1 SCOPE

This specification covers the removal, temporary stockpiling, the loading, transporting, depositing, and spreading selected topsoil on designated areas and/or finished slopes.

20-2 MATERIAL

Material for this item shall be obtained from excavated areas, areas upon which embankments shall be placed, or other designated areas.

20.3 CONSTRUCTION METHODS

Trash, wood, brush, stumps, roots, rocks over six (6) inches in diameter, and other objectionable material encountered shall be removed and disposed of, as specified under paragraph 1-4, Specification 1-58, Clearing or Paragraph 2.5 of Specification 2-58, Clearing and Grubbing, prior to the beginning of work required by this item. The top soil will be stockpiled on areas mutually satisfactory to the Contractor and the engineer in neat, uniform windrows or piles to facilitate their measurement before spreading. All topsoil salvaged shall be spread on the areas and/or finished slopes to a depth as shown on the drawings, or as designated by the engineer. After the spreading of topsoil all large stiff clods, hard lumps, large stones, trash, wood, brush, stumps, roots or other objectionable material shall be gathered up, removed from the topsoiled area and disposed of as specified under Paragraph 1.4 of Specification 1-58, Clearing, or Paragraph 2.5 of Specification 2-58, Clearing and Grubbing.

20.4 MEASUREMENT AND PAYMENT

Salvaging and placing topsoil will be measured for payment on the basis of number of cubic yards of topsoil material acceptably placed on the structure at the location(s) shown on the drawings or as designated by the engineer. Cross sections will be taken of the stockpiles (1) before any material is placed, and (2) after placing of the required topsoil, but before the leveling of the excess. The volumes computed from this data using the method of average end areas shall be used as the volume of material.

Payments on the volume as computed above and at the contract unit price per cubic yard for "Salvaging and Placing Topsoil" shall constitute full payment of removing, temporary stockpiling, loading, depositing and spreading topsoil, and for all labor, tools, and incidentals necessary to complete the work as herein specified.

23 - ESTABLISHING VEGETATION**23.1** SCOPE

This specification covers the furnishing of all labor, equipment and materials, and performing all operations in connection with soil preparation, liming, fertilizing, seeding, and mulching of the embankment, spillway, and exposed soil areas disturbed during construction. Approximate areas to be treated will be shown on the drawings and shall be staked or otherwise designated by the engineer.

23.2 SEEDBED PREPARATION AND SEEDING

Lime shall be uniformly applied to the areas to be seeded at a rate of not less than two (2) tons per acre.

Fertilizer shall be uniformly applied to the areas to be seeded at a rate of not less than one thousand (1,000) pounds per acre.

The lime and fertilizer shall be thoroughly mixed into the upper three (3) to six (6) inches of topsoil; except that when hydro-seeding techniques are employed, the fertilizer may be applied in solution with the seed without further mixing with the soil.

A fine, firm seedbed shall be prepared free of clods or other surface obstructions. The final tillage operation prior to seeding shall be cultipacking or rolling, except that cultipacking or rolling will not be required where slopes are encountered that make the power operation of this type of equipment impractical, as determined by the Engineer. No seeding shall be performed prior to inspection and approval of the seedbed by the Engineer.

Seed mixtures, including quantities, species, varieties, strains, and special seed treatments shall be as designated on the drawings.

Seeding shall be carried out during the period August 1 to October 1, except as otherwise approved by the Engineer.

Seed shall be distributed on the soil surface uniformly over the areas seeded.

The area shall be cultipacked or rolled after seeding; except where slopes are encountered that make the power operation of this type of equipment impractical as determined by the Engineer; or except when hydro-seeding techniques are employed.

23.3 MULCHING AND OTHER PROTECTION MEASURES

23.3.1 Mulching. As designated in the plans, mulch shall be applied to seeded areas at the rate of not less than one (1) nor more than one and one-half (1 1/2) tons of mulch per acre. The mulch shall be uniformly distributed. When designated on the plans, the mulch shall be anchored by cutting it slightly into the soil surface with a disc harrow or equivalent suitable equipment as approved by the Engineer.

23.3.2 Anchoring Mulch with Paper Twine Fabric. When designated on the plans, the mulch shall be covered with paper twine fabric, applied in accord with the manufacturers' instructions.

23.3.3 Jute Netting. Jute netting shall be applied to areas as designated in the plans. The soil surface shall be prepared and the jute applied and anchored in accord with manufacturers' instructions. Following the application of the jute, the juted area shall be over-seeded at not less than one-half (1/2) the rate specified for the seeding for the area.

23.4 MEASUREMENT AND PAYMENT

23.4.1 Seedbed Preparation and Seeding. The area seeded shall be measured to the nearest one-tenth (0.1) acre. Payment will be made at the contract unit price per acre for "Seedbed Preparation, Seeding, Liming and Fertilizing". Such payment shall constitute full compensation for all labor, materials, supplies, equipment and incidentals necessary to complete this item.

23.4.2 Mulching and Other Protection Measures.

23.4.2.1 Mulching. The quantity of mulch applied shall be measured to the nearest one-tenth (0.1) ton. Payment will be made at the contract unit price per ton for "Mulching". Such payment shall constitute full compensation for furnishing all labor, materials, supplies, and equipment necessary to complete this item.

23.4.2.2 Paper Twine Fabric. The quantity of paper twine fabric applied shall be measured to the nearest one (1) square yard. Payment will be made at the contract unit price per square yard for "Anchoring Mulch with Paper Twine Fabric". Such payment shall constitute full compensation for furnishing all labor, materials, supplies, equipment and incidentals necessary to complete this item.

23.4.2.3 Jute Netting. The quantity of jute netting applied shall be measured in place to the nearest one (1) square yard. Payment will be made at the contract unit price per square yard for "Jute Netting". Such payment shall constitute full compensation for furnishing all labor, materials, supplies, equipment and incidentals necessary to complete this item.

CONSTRUCTION MATERIAL SPECIFICATION100 - CEMENT100.1 SCOPE

This specification covers the requirements of Portland cement with or without air-entrainment.

100.2 QUALITY

100.2.1 Portland Cement (Type I). Portland cement, Type I, shall meet the requirements of ASTM Designation C-150.

100.2.2 Air-Entraining Portland Cement (Type IA). Air-entraining Portland cement, Type IA, shall meet the requirements of ASTM Designation C-175 for the type of cement specified.

100.3 STORAGE OF CEMENT

Cement shall be properly stored and protected from weather, dampness or other destructive agencies and any cement which is damaged will be rejected and not permitted to be used in the work.

100.4 SAMPLING AND TESTING

Portland cement, Type I, shall be subject to sampling and testing in accordance with ASTM Designation C-150.

Air-entraining Portland cement, Type IA, shall be subject to sampling and testing in accordance with ASTM Designation C-175.

CONSTRUCTION MATERIAL SPECIFICATION101 - AGGREGATES101.1 SCOPE

This specification covers the requirements of fine and coarse aggregates used in making concrete.

101.2 FINE AND COARSE AGGREGATES

Fine and coarse aggregates shall conform to the provisions of ASTM Designation C-33, Concrete Aggregates.

101.3 STORAGE

Aggregates shall be stored in such a manner as to avoid the inclusion of any foreign material in the concrete. The storage piles shall be constructed so as to prevent segregation. The deposition of material in storage and its removal therefrom shall be done in such a manner to increase the uniformity of the grading insofar as is practicable. All fine aggregate shall remain in free drainage storage for at least seventy-two (72) hours prior to use.

101.4 SAMPLING AND TESTING

When testing is required, the sampling shall be done in accordance with, and the testing results conform to the above ASTM Standards and the references contained therein. The source from which the aggregates are to be obtained shall be selected well in advance of the time when the material will be required in the work. Samples of the aggregates when requested, shall be furnished at least fifteen (15) days in advance of the time when the placing of concrete is expected to begin. Unless otherwise specified, all test samples shall be taken under the supervision of the Engineer and delivered to the designated point by the Contractor at his expense. All required tests will be made by and under the supervision of the Engineer. The Contractor shall provide such facilities as the Engineer may consider necessary for the ready procurement of representative test samples.

CONSTRUCTION MATERIAL SPECIFICATION

102 -

WATER102.1 SCOPE

This specification covers the requirements for water used in making concrete and mortar, washing aggregates and curing concrete.

102.2 QUALITY

Water used for washing aggregates, mixing concrete or mortar and curing concrete shall be clean, free from injurious amounts of oil, acid, salts, alkalies, organic matter, sewage, or other deleterious substances.

102.3 INSPECTION AND TESTING

The water used for the purposes mentioned above shall be subject to approval by the Engineer.

CONSTRUCTION MATERIAL SPECIFICATION103 - STEEL REINFORCEMENT103.1 SCOPE

This specification covers the requirements for steel reinforcement used in concrete.

103.2 QUALITY

103.2.1 Deformed Bars. Bars shall comply with the Standard Specifications for Billet Steel Bars for Concrete Reinforcement, ASTM Designation A-15 and shall be deformed bars of intermediate grade made by the open-hearth process. All bars shall be rolled so as to comply with the requirements of the Standard Specifications for Minimum Requirements for the Deformation of Deformed Steel Bars for Concrete Reinforcement, ASTM Designation A-305.

103.2.2 Welded Wire Fabric. Welded wire fabric shall comply with the Standard Specifications for Welded Steel Wire Fabric for Concrete Reinforcement, ASTM Designation A-185.

103.3 INSPECTION AND SAMPLING

When requested, the Contractor shall secure from the manufacturer, and furnish in duplicate, certified copies of the mill test report for each delivery of bar reinforcing steel to the job. The bars shall be properly tagged so as to permit identification of the heat number shown on the mill test report for any and all steel delivered to the work.

103.4 STORAGE

Steel reinforcement shall be stored above the surface of the ground upon platforms, skids, or other supports and shall be protected, as far as practicable, from mechanical injury and surface deterioration caused by conditions producing rust.

103.5 TESTS

When tests are required, reinforcement will be tested in accordance with the above ASTM Specification for each class, except that tensile tests shall comply with the Standard Methods of Tension Testing of Metallic Materials, ASTM Designation E-8.

CONSTRUCTION MATERIAL SPECIFICATION104 - AIR-ENTRAINING ADMIXTURES104.1 SCOPE

This specification covers air-entraining agents added to the concrete mixtures.

104.2 ADMIXTURES

The air-entraining admixtures shall fully meet the requirements of ASTM Designation C-260, Air-Entraining Admixtures for Concrete.

104.3 TESTING

The properties of the admixture enumerated in ASTM Designation C-260 shall be subject to tests in accordance with ASTM Designation C-233, Testing Air-Entraining Admixtures for Concrete.

CONSTRUCTION MATERIAL SPECIFICATION105 - CURING COMPOUNDS105.1 SCOPE

This specification covers the requirements for liquid-membrane-forming compounds suitable for spraying on concrete surfaces to retard the loss of water during the curing process.

105.2 QUALITY

The curing compound shall conform to ASTM Designation C-309, Liquid Membrane-Forming Compounds for Curing Concrete.

Unless otherwise specified the compound shall be the clear or translucent type and shall contain a fugitive dye to assist in securing uniform coverage.

105.3 DELIVERY AND STORAGE

All curing compound shall be delivered to the site of the work in the original sealed container bearing the name of the manufacturer, the brand name and the manufacturer's batch number. The condition of the compound shall be approved prior to use.

105.4 TESTING

When required, testing of curing compounds shall be done in conformance with ASTM Designation C-156.

CONSTRUCTION MATERIAL SPECIFICATION106 - EXPANSION JOINT FILLER106.1 SCOPE

This specification covers expansion joint fillers for concrete for the following types: Bituminous Type, and Non-Extruding Resilient Types.

106.2 BITUMINOUS TYPE

This expansion joint filler shall conform to ASTM Designation D-994 for Preformed Expansion Joint Filler for Concrete, (Bituminous Type).

106.3 NON-EXTRUDING AND RESILIENT TYPES

This expansion joint filler shall conform to ASTM Designation D-544 for Preformed Expansion Joint Filler for Concrete, (Non-Extruding and Resilient Types).

106.4 TESTS

When tests are required, they shall be made in conformance with the references included in the applicable ASTM Designations cited in this specification.

CONSTRUCTION MATERIAL SPECIFICATION

107 -

WATERSTOPS107.1 SCOPE

This specification covers the materials from which waterstops may be fabricated or premolded. The materials covered are copper, steel, wrought iron, plastic material and rubber.

107.2 COPPER

Copper used for waterstops shall conform to ASTM Designation B-248 for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar.

107.3 STEEL

Steel used for waterstops shall conform to ASTM Designation A-366 for Cold Rolled Carbon Steel Sheets, Commercial Quality or ASTM Designation A-93 for Zinc Coated (Galvanized) Iron or Steel Sheets, Coils, and Cut Lengths.

107.4 WROUGHT IRON

Wrought iron used for waterstops shall conform to ASTM Designation A-162 for Uncoated Wrought Sheets or ASTM Designation A-163 for Zinc Coated (Galvanized) Wrought Iron Sheets.

107.5 PLASTIC

Plastic material used for waterstops shall conform to ASTM Designation D-742 for Vinyl Chloride-Acetate Resin.

107.6 RUBBER

The rubber waterstop material shall meet the following physical requirements when tested in accordance with the appropriate sections of Federal Specification ZZ-R-601, ASTM Designation D-395 and ASTM Designation D-676:

107.6.1 Hardness. The Shore A durometer hardness shall be 60 to 70.

107.6.2 Elongation. The elongation shall be a minimum of 400 percent.

107.6.3 Tensile Strength. The tensile strength shall be a minimum of 2500 pounds per square inch.

107.6.4 Water Absorption. The water absorption shall be a maximum of 5 percent by weight after immersion in water for two days at 158 degrees F.

107.6.5 Tensile Strength after Aging. The tensile strength after accelerated aging for five days at 158 degrees F. shall not be less than 80 percent of the original tensile strength.

107.6.6 Compression Set. The compression set after 22 hours at 158 degrees F. shall not be more than 30 percent.

107.6.7 Specific Gravity. The specific gravity shall be 1.20 plus or minus .05.

107.7 TESTS

When tests of the material are required, they shall be made in accordance with the references included in the applicable Federal Specifications or ASTM Designations cited in this specification.

CONSTRUCTION MATERIAL SPECIFICATION

109 -

CONCRETE PIPE109.1 SCOPE

This specification covers the quality and testing of reinforced concrete pipe and fittings.

109.2 REINFORCED CONCRETE PIPE

The dimensions of the pipe shall be as specified in the drawings. The pipe shall be manufactured to withstand the internal and external loading as specified on the drawings. No elliptical reinforcing shall be permitted.

Reinforced concrete pipe shall consist of the following types and classes:

109.2.1 Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe. Reinforced concrete culvert, storm drain, and sewer pipe shall conform to the requirements of ASTM Designation C-76 for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe, and shall be of five classes identified as Class I, Class II, Class III, Class IV and Class V.

109.2.2 Reinforced Concrete Water Pipe. Reinforced concrete water pipe shall conform to the requirements of Standard Specification AWWA-C300 for Reinforced Concrete Water Pipe-Steel Cylinder Type-Not Prestressed, or AWWA-C301 for Reinforced Concrete Water Pipe-Steel Cylinder Type-Prestressed, or AWWA-C302 for Reinforced Concrete Water Pipe-Non-Cylinder Type-Not Prestressed designed with a steel ring bell and spigot joint with round continuous rubber gasket.

109.3 TESTS

All concrete pipe and fittings shall be subject to testing in accordance with the provisions of the ASTM Designations cited in this specification.

CONSTRUCTION MATERIAL SPECIFICATION110 - CORRUGATED METAL PIPE AND FITTINGS110.1 SCOPE

This specification covers the quality and testing of circular, elliptical and arched corrugated metal pipe, with either annular or spiral corrugations, fittings and appurtenances.

110.2 BASE MATERIALS

Corrugated metal pipe, coupling bands, diaphragms, baffle walls and pipe fittings shall be fabricated from corrugated galvanized sheets, the base metal of which shall be made by the open hearth process, or a process that produces genuine wrought iron.

The base metal in respect to chemical constituents shall conform to one of the following alternatives, and unless otherwise shown on the drawings, the Contractor shall have the option of installing any one of the six:

CHEMICAL COMPOSITION BY LADLE ANALYSIS IN PERCENTKIND OF BASE METAL

Elements	Pure Iron	Copper-Bearing Pure Iron	Copper Iron	Copper Molybdenum Iron	Copper Steel	Genuine Wrought Iron	Tolerance by Check Analysis of Finished Sheets
Carbon, Max.	--	--	--	--	--	.05	--
Manganese, Max.	--	--	--	--	--	.06	--
Phosphorus, Max.	.015	.015	.015	.015	--	.12	--
Sulphur, Max.	.040	.040	.040	.040	.050	.04	.010
Silicon, Max.	--	--	--	--	--	.15	--
Copper, Min.	--	.20	.20	.40	.20	--	.02
Molybdenum, Min.	--	--	--	.05	--	--	--
Sum of first 5 Elements, Max.	--	.10	.25	.25	.70	.42	.04
Sum of first 6 Elements, Max.	.10	--	--	--	--	--	.04

Metal sheets before galvanizing shall be smooth and free from blisters, seams and pits.

110.3 IDENTIFICATION

All metal pipe shall be identified by a stamp on each pipe showing:

First - name of sheet manufacturer

Second - name of brand and kind of base metal

Third - gage number

Fourth - weight of zinc coating

Fifth - identification symbols showing heat number and pot number.

The identification stamps shall be placed on the sheets by the manufacturers of the sheets in such a way that when rolled into pipe such identification shall appear on the outside of each pipe. The right is reserved to inspect the pipe either at the place of manufacture or after its arrival at destination.

The kind of base metal shall be designated independently of the brand or trademark so as to identify clearly the base metal furnished with one of the alternatives shown. The designation of the alternatives may be accomplished by placing on the sheets the initial letters of the exact name of the base metal given in the table, as follows:

PI	for pure iron
CBPI	for copper-bearing pure iron
CI	for copper iron
CMI	for copper molybdenum iron
CS	for copper steel, - and -
GWI	for genuine wrought iron

110.4 CORRUGATIONS

(a) Pipe with annular corrugations shall have corrugations with a pitch of 2-2/3 inches and a depth of 1/2 inch. The allowable tolerance on the pitch and depth shall be 1/8 inch.

(b) Pipe with spiral (helical) corrugations shall have corrugations with a pitch of 1-1/2 to 1-3/4 inches inclusive measured at right angles to the corrugations and a depth of 1/4 inch. The allowable tolerance for pitch and depth shall be 1/8 inch and 1/16 inch, respectively.

110.5 RIVETS

Rivets shall be galvanized and of the same material as the base metal specified for the corrugated sheets.

110.6 RIVETED SEAMS

Rivets shall be not less than 5/16 inch in diameter for sheets weighing 3.28 pounds per square foot (14 gage) and lighter, and not less than 3/8 inch in diameter for sheets weighing over 3.28 pounds and shall be driven cold in such a manner that the sheets will be drawn tightly together throughout the entire lap. The distance between the center of any rivet and the edge of the sheet shall in no case be less than twice the diameter of the rivet. All rivets shall have neat, workmanlike and full hemispherical heads, shall be driven without bending, and shall completely fill the holes. Longitudinal seams for pipe less than 42 inches in diameter shall be riveted with one rivet in the valley of each full corrugation unless indicated otherwise on the drawings. The longitudinal seams of all pipes 42 inches or more in diameter shall be double-riveted. Circumferential seams shall have a maximum rivet spacing of 6 inches. The minimum width of longitudinal seam lap shall be as follows:

<u>Nominal Diameter (Inches)</u>	<u>Minimum Width of Lap (Inches)</u>
6 to 21 inclusive	1-1/2
24 to 36 inclusive	2
Over 36	3

110.7 WELDED SEAMS

The seams shall be continuously welded so that the welds shall be as strong as the base metal. All welding shall be done before galvanizing except where special connections make it impractical to do so. Welds made after galvanizing shall be thoroughly cleaned and then painted with one or more coats of zinc dust-zinc oxide primer conforming to Federal Specification TT-P-641, covering both the weld and the adjacent exposed metal where the galvanizing has been removed by the welding process.

110.8 FOLDED SEAMS

Seams shall be so constructed as not to form an element of weakness.

110.9 WATER-TIGHT PIPE

When called for on the drawings, water-tight pipe shall have all seams close-riveted with a maximum rivet spacing of three (3) inches and shall be capable of satisfactorily containing water under pressure.

110.10 ASBESTOS-RODDED

The inside and outside of the corrugated metal pipe, diaphragms, tees, elbows, baffle walls, and coupling bands when shown on the drawings shall be coated with a layer of asbestos fibers, applied while the metal is in a sheet form, by pressing into a molten metallic bonding medium. Immediately after the metallic bond has been solidified, the asbestos fibers shall be thoroughly saturated with a bituminous saturant. The finished sheets shall be of first-class commercial quality free from blisters and unsaturated spots.

110.11 BITUMINOUS COATING

110.11.1 General. When shown on the drawings, the inside and outside of the corrugated metal pipe, coupling bands and both sides of the diaphragms and baffle wall shall be completely coated with asphalt-cement to a minimum thickness of 0.05 inch measured at the crest of the corrugations. Immediately prior to the application of the bituminous coating, the corrugated metal pipe shall be cleaned of all dirt, mill scale, grease, or loose rust and shall be dry. The outside of the pipe shall be suitably marked at the correct place at both ends to clearly designate the centerline of the top of the pipe.

110.11.2 Bituminous Coating Material. All tests on bituminous material shall be made on samples secured from the material actually being used to coat the pipe. The material shall be not less than ninety-nine and one-half (99.5) percent soluble in carbon bisulfide as determined by ASTM D4. It shall have a loss not greater than one (1) percent when heated to a temperature of 163 degrees C. determined in accordance with ASTM D6. The penetration of residue after heating compared with penetration of the same sample before testing for loss on heating shall not be less than eight-five (85) percent as determined by ASTM D5. The bituminous material shall adhere to the metal tenaciously, shall not chip off in handling and shall protect the metal from deterioration. The ability of the bituminous material to remain in place on the pipe without flowing or sagging due to summer temperatures and the imperviousness of the bituminous material shall be tested as follows:

(a) Flow Test. Two test specimens in the form of cylinders each $\frac{3}{8}$ inch in diameter and $\frac{3}{4}$ inch in length are obtained by pouring the excess molten bitumen into amalgamated brass molds. Place each specimen in a corrugation of the corrugated slide (slide to be on the 45 degree slope) so that the lower end of each specimen will rest exactly along the line scribed 6 inches from the bottom edge of the slide. Place the test apparatus with the specimens in place in an oven maintained at 150 degrees F., plus or minus 2 degrees. After 4 hours, remove from the oven and

cool to room temperature. Measure the distance from the bottom of the corrugated plate to the lower edge of the test specimens. This distance subtracted from 6 inches determines the amount of sag or flow. To be acceptable, the flow must not exceed 1/4 inch for either of the two specimens.

(b) Imperviousness Test. A representative sample of coated pipe shall be tested with a twenty-five (25) percent solution of sulphuric acid, a twenty-five (25) percent solution of sodium hydroxide, or a saturated solution of sodium chloride placed in the valley of a corrugation and allowed to remain for a period of forty-eight (48) hours. At the end of this period the bituminous material shall not have loosened or separated from the metal.

110.11.3 Paved Invert. When called for on the drawings, paved inverts on the pipe shall consist of an additional layer of bituminous material applied to form a smooth lining covering twenty-five (25) percent of the internal circumference of circular pipe and forty (40) percent of the internal surface of pipe arches. The lining shall fill the corrugations and have a minimum thickness of one-eighth (1/8) inch above the crest of the corrugations.

110.12 PERFORATIONS FOR DRAINAGE

Perforations, when specified or shown on the drawings, shall be arranged in two groups of longitudinal rows placed symmetrically on either side of an unperforated segment corresponding to the flow line of the pipe. Within each group, the rows of perforations shall be spaced transversely 1 to 1-1/2 inches center to center and in each row the perforations shall be located in the inside crests of all corrugations, except that perforations are not required within 4 inches of each end of each length of pipe or in the crests of corrugations where seams are located. The perforations shall have a diameter of not less than 1/4 inch and not more than 7/16 inch. The minimum number of longitudinal rows of perforations and the minimum width of the unperforated segment shall be as hereinafter specified. The centerlines of the top or outer rows of holes shall be not more than 80 degrees from the centerline of the unperforated segment.

Nominal diameter of pipe (inches)	Minimum number of longitudinal rows of perforations	Minimum width of unperforated seg- ment measured along the circumference of the pipe (Inches)
6	4	4-1/2
8	4	7
10	4	9
12	6	9-1/2
15	6	13
18	6	16-1/2
21	6	20

110.13 STANDARD FIELD COUPLING BANDS

Field coupling of pipe sections shall be accomplished by means of coupling bands, unless otherwise specified. The band couplers shall be at least five (5) corrugations wide for annular corrugated pipe or seven (7) inches for spiral corrugated pipe. The strength of the band couplers shall be sufficient to securely bind the pipe sections together. The minimum gage for band couplers shall be as indicated in the following tabulation unless otherwise specified:

<u>Diameter in Inches</u>	<u>Gage No.</u>
6 to 25 inclusive	16
30 to 54 inclusive	14
60 to 78 inclusive	12
84 to 96 inclusive	10

The bands shall be so constructed as to lap on an equal portion of each of the culvert sections to be connected, and preferably shall be connected at the ends by galvanized angles having minimum dimensions of two (2) inches by two (2) inches by 3/16 inch. Bands for annular corrugated pipe shall have at least three (3) galvanized bolts not less than 1/2 inch in diameter. Bands for spiral corrugated pipe shall have at least two (2) galvanized bolts not less than 3/8 inch in diameter. Other equally effective methods of connecting the coupling bands may be used with prior approval.

110.14 WATER-TIGHT COUPLING BANDS

The coupling bands shall be made with sixteen (16) gage galvanized steel of at least equal quality to the base metal in the pipe. On pipes smaller than 18 inch diameter a gasket of synthetic sponge rubber shall be placed between the band and the pipe, and the band shall be coated on the outside only with bituminous material applied during or after assembly of the pipe. Bands shall be a minimum of six and three-eighths (6-3/8) inches wide and shall be constructed to firmly mesh with and seat in the end corrugations of each of the pipe sections to be joined.

On pipes eighteen (18) inches in diameter and larger coupling bands shall be coated with bituminous material on both sides and held securely in place with rods and tank lugs which conform to the curvature of the pipe. The rods and nuts shall be galvanized. The tank lugs shall be of cast iron conforming to Federal Specification CC-I-652 for Iron, Gray; Castings and shall be galvanized. The coupling bands shall have a minimum width of five (5) corrugations for pipe from eighteen (18) to forty-eight (48) inch diameter and a minimum width of nine (9) corrugations for pipe greater than forty-eight (48) inch diameter. The band shall lap an equal portion of each section of jointed pipe and shall have a minimum circumferential lap of six (6) inches. The coupling bands shall be held in position by at least four (4) rods and tank lugs. The rivets in that portion of the longitudinal seams to be covered by the coupling bands shall be omitted and the seam joined by a continuous weld on the inside and outside of the pipe.

110.15 BAFFLE WALLS (DIAPHRAGMS)

The baffle wall shall consist of corrugated metal sheets and structural steel shapes as indicated on the drawings.

110.16 END REINFORCEMENT

The inlet and outlet ends of pipes constructed of material lighter than No. 10 gage that are to be installed without headwalls, shall be reinforced by either a roll end or a band end.

Other approved methods of end reinforcement may be used, such as light angles or channels, formed to a circle and riveted to the pipe, or a single or double thickness of metal in the rolled end.

110.17 SPECIAL PIPE

Unless otherwise specified all corrugated metal pipe used or furnished under the contract shall be plain galvanized corrugated metal pipe manufactured as herein specified. Where specially manufactured pipes are to be used, specific mention thereto will be made in the Special Specifications or on the drawings.

110.18 INSPECTION

The completed pipe must show first-class, careful workmanship throughout; and any pipe in which defective workmanship is apparent in any respect will be rejected. The following listed defects in particular are specified as constituting poor workmanship, and the presence of any such defects in any pipe will be sufficient cause for its rejection.

- | | |
|---|---|
| a. Uneven laps | g. Unfinished ends |
| b. Elliptical shaping | h. Illegible brand |
| c. Variation from a straight centerline | i. Lack of rigidity |
| d. Ragged or diagonally sheared edges | j. Bruised, scaled or broken zinc coating |
| e. Loose, unevenly lined or spaced rivets | k. Dents or bends in the metal itself other than corrugations |
| f. Poorly formed rivet heads | |

Each individual pipe shall fully conform with the requirements of this specification and if 20 percent of those in any lot or shipment fails to conform, the entire lot or shipment may be rejected.

110.19 CERTIFIED TESTS

Certified tests for chemical analysis and weight of spelter coating for any of the materials furnished by the Contractor may be required. Unless otherwise specified, chemical analysis shall be in accordance with the Standard Method of Test ASTM E30 and the weight of spelter coating shall be determined in accordance with Standard Method of Test ASTM A90.

CONSTRUCTION MATERIAL SPECIFICATIONWROUGHT IRON, STEEL, COPPER AND CAST IRON PIPE AND FITTINGS112.1 SCOPE

This specification covers the requirements of wrought iron pipe, steel pipe, steel flanges and fittings and malleable iron pipe fittings, copper pipe and fittings, and cast iron pipe and fittings.

112.2 WROUGHT IRON PIPE

Wrought iron pipe shall meet the requirements of ASTM Designation A72, for Welded Wrought Iron Pipe.

112.3 STEEL PIPE

Steel pipe shall meet the requirements of ASTM Designation A120 for Black or Hot-Dipped Zinc Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses.

112.4 STEEL PIPE FLANGES AND FITTINGS

Steel pipe flanges and fittings shall meet the requirements of ASTM Designation A181 for Forged or Rolled Steel Pipe Flanges, Forged Fittings and Valves and Parts for General Use.

112.5 MALLEABLE IRON PIPE FITTINGS

Malleable iron pipe fittings shall meet the requirements of Federal Specification WW-P-521b for Pipe Fittings; Malleable Iron (Screwed) 150 Pounds.

112.6 CAST IRON PIPE AND FITTINGS

Cast iron pipe shall be centrifugally cast according to American Standards Association Specification A-21.6 or 21.8 with metal designation 18-40. It shall have a minimum wall thickness and operating pressure as shown on the drawings. Joints and connections shall be as indicated on the plans.

The pipe shall be completely coated inside and outside by immersion in a coal-tar pitch varnish.

Other appurtenances shall conform to the dimensions indicated on the drawings.

112.7 COPPER PIPE AND FITTINGS

Copper tubing shall conform to the requirements of ASTM Designation B88-55 for Seamless Copper Water Tube. The fittings and fixtures shall be cast or wrought bronze or wrought copper of the solder-joint or flared-tube type as shown on the drawings. Bronze fittings and fixtures shall contain not less than eighty-five (85) percent copper and shall conform to the applicable requirements of Federal Specification WW-P-460 for Pipe - Fittings; Bronze (Screwed) 125 and 250 Pound.

All pipe and fittings shall be subject to the tests cited and references noted in the applicable Federal Specifications and ASTM Designations.

CONSTRUCTION MATERIAL SPECIFICATIONSTRUCTURAL METAL117.1 SCOPE

This specification covers structural shapes, eye-bars, castings, rods, with necessary nuts and washers, metal shoes, and plates, but shall not include hardware.

117.2 STRUCTURAL STEEL

Structural shapes, rods, and plates shall be of structural steel conforming to the Standard Specifications for Steel for Bridges and Buildings, ASTM Designation A-7 unless otherwise specified.

117.3 CASTINGS

Steel castings shall conform to the Standard Specifications for Mild-to-Medium Strength Carbon-Steel Castings for General Application, ASTM Designation A-27, Grade 63-35, unless otherwise specified, or they shall be cast iron conforming to the Standard Specifications for Gray Iron Castings, ASTM Designation A-48, Class 40, unless otherwise specified.

CONSTRUCTION MATERIAL SPECIFICATIONGALVANIZING119.1 SCOPE

This specification covers zinc coatings (galvanized) applied by the hot-dip process on iron and steel products.

119.2 ZINC FOR COATING

The zinc used for coating shall be the grade of zinc designated in the ASTM specification for the iron or steel product to be coated, and shall meet the requirements of ASTM Designation B-6 for Slab Zinc (Spelter).

119.3 WEIGHT OF ZINC COATING

The weight of zinc coating per square foot of actual surface shall be in accordance with the ASTM specifications for the iron or steel product coated.

119.4 SPECIFICATION FOR GALVANIZING (ZINC COATING)

Materials shall be hot-dipped galvanized in accordance with the latest revision of the appropriate ASTM Specifications listed in the following table:

<u>Material</u>	<u>ASTM Designation</u>
Iron and Steel Hardware, Screws, Bolts, Nuts, Washers, Anchor Bolts, Grey Iron and Malleable Iron Castings, Steel Castings	A-153
Corrugated Metal Pipe, Steel or Iron Sheets	A-93 Classic C Coating
Structural Steel Shapes, Tie Rods, Ornamental Iron Railings, Handrails	A-123
Steel and Iron Pipe	A-120
Iron and Steel Wire and Farm-Field Wire Fencing	A-116 Class 2 Coating
Chain Link Fence Fabric, Galvanized after Weaving	A-392
Chain Link Fence Fabric, Galvanized before Weaving	A-392 Class A-A Coating
Barbed Wire	A-121 Class 2 Coating
Steel Wire Strand, Galvanized and Extra Galvanized	A-122 Class A Coating

BITUMINOUS-FIBRE PIPE120.1 SCOPE

This specification covers the quality and testing of both perforated and non-perforated bituminous fibre pipe and fittings.

120.2 PIPE

The pipe and fittings shall conform to the National Bureau of Standards, Commercial Standard Specification CS-116.

120.3 PERFORATIONS

The size and spacing of holes shall be in accordance with the pipe manufacturer's recommendations or as shown on the drawings.

120.4 TESTS

The pipe and fittings shall be subject to the tests cited and references noted in the Commercial Standard Specification CS-116.

121 - VEGETATION MATERIALS121.1 SCOPE

This specification covers the requirements for fertilizer, lime, seed, and mulch and associated materials.

121.2 FERTILIZER

Fertilizer shall be a complete commercial fertilizer of 10-5-5 grade, or approximate equivalent as approved by the Engineer. Forty (40) percent or more of the nitrogen in the fertilizer shall be in organic form.

121.3 LINE

Line shall be ground limestone containing not less than thirty-five (35) percent calcium oxide, and not less than five (5) percent magnesium oxide; and particle size shall be in conformance with the 1960 Definition C-6 of the Association of American Fertilizer Control Officials for "Pulverized" limestone.

121.4 SEED

Seed shall be fresh, recleaned seed of the latest crop and shall meet the minimum standards for tolerance for P.L.S. (Purity x Germination) contained in the current Federal Seed Act.

121.5 MULCH

Mulch shall be bright, clean cereal (oat, wheat, rye) grain straw.

121.6 PAPER TWINE FABRIC

Paper twine fabric shall be Remis Mulchnet, or equivalent.

121.7 JUTE NETTING

Jute netting shall be Ludlow "Soil Saver", No. 48, or equivalent.

Westfield, Powdermill Brook Watershed - Work Plan for Watershed Protection & Flood Prevention - August 1961.



1961 Reports

Westfield, Powdermill Brook Watershed - Work Plan for Watershed Protection & Flood Prevention - August 1961. U S Department of Agriculture Soil Conservation Service.

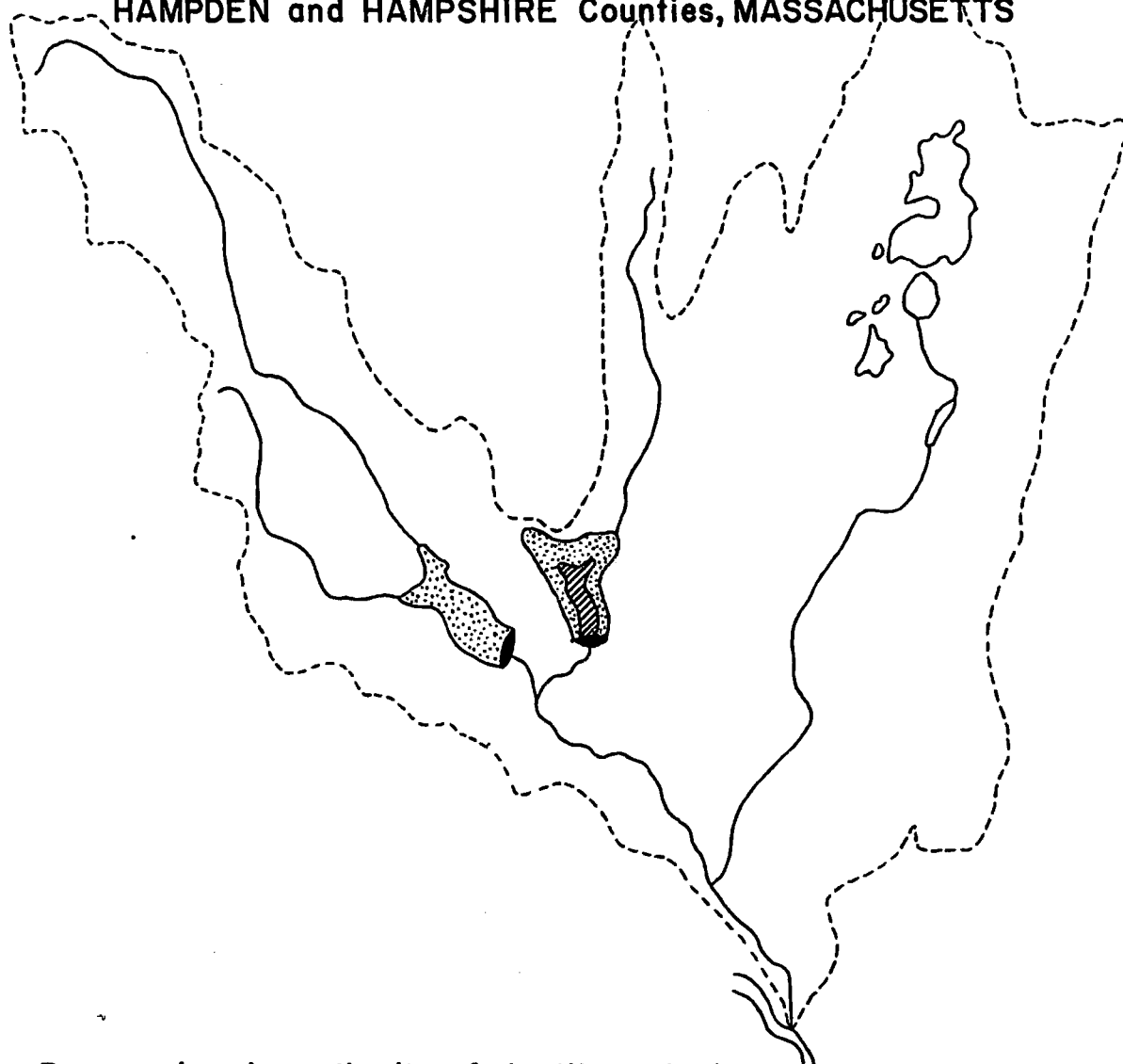
City/Town	Westfield
City/Town	Montgomery
Name	U S A Agriculture
Railroads	Boston & Albany Railroad
Railroads	New York New Haven & Hartford Railroad
Streets	Massachusetts Turnpike
Streets	North Road
Streets	Route 90
Streets	Buck Pond Road
Streets	Powdermill Road
Streets	Route 202
Streets	Lockhouse Road
Streets	Montgomery Road
Streets	North Elm Street
Streets	Route 10
Water	Powdermill Brook
Water	Arm Brook
Water	Bush Brook

Water	Sandy Mill Brook
Water	Westfield River
Water	Chapin Pond
Water	Hampton Ponds
Water	Buck Pond

**WATERSHED WORK PLAN
FOR
WATERSHED PROTECTION AND FLOOD PREVENTION**

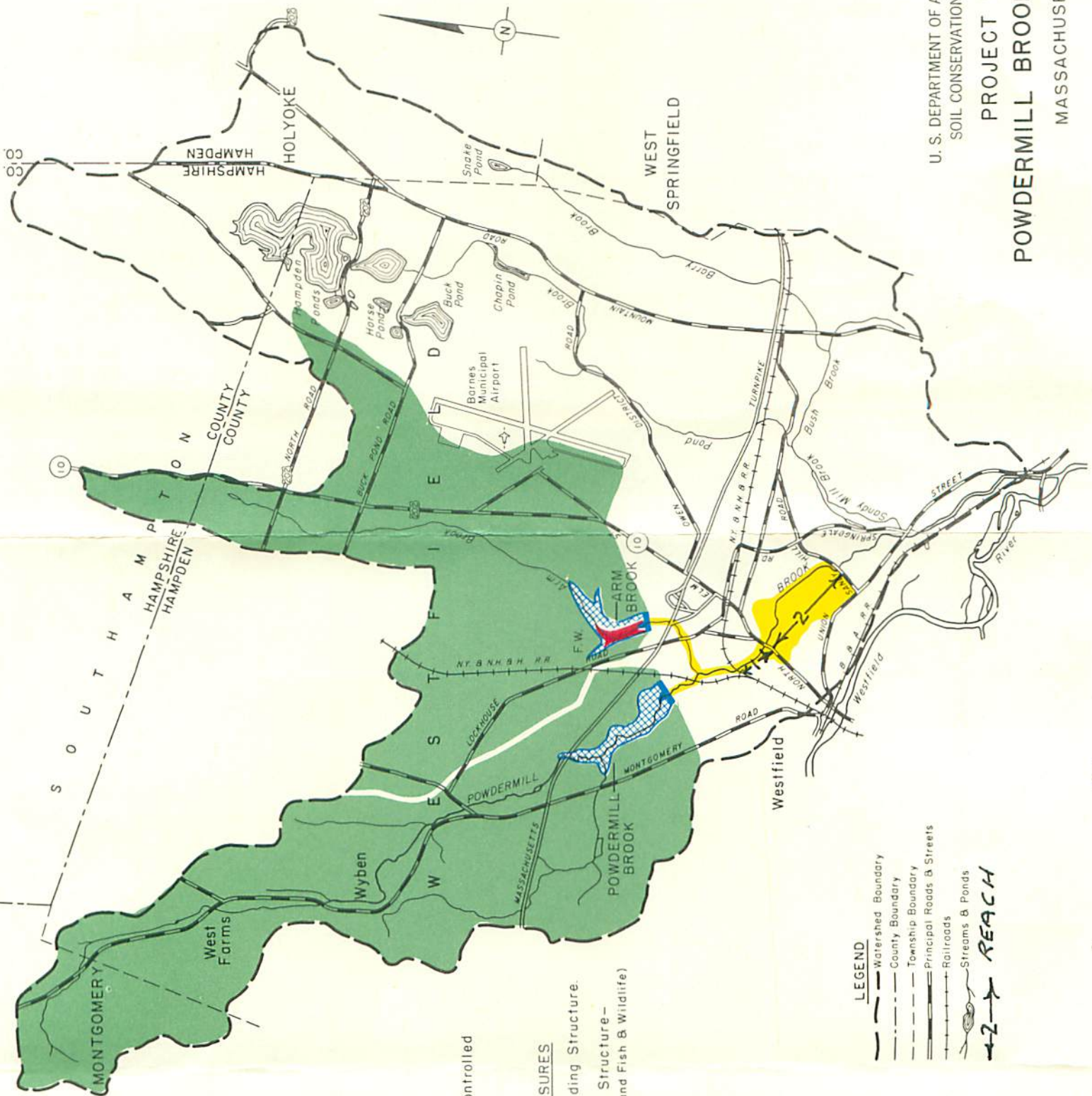
POWDERMILL BROOK WATERSHED

HAMPDEN and HAMPSHIRE Counties, MASSACHUSETTS



**Prepared under authority of the Watershed Protection and Flood
Prevention Act (Public Law 566, 83d Congress, 68 Stat. 666) as amended**

August 1961



- LEGEND**
- Drainage Area Controlled by Structure.
 - Area Benefited.
- PROJECT MEASURES**
- Floodwater Retarding Structure.
 - Multiple Purpose Structure—(Flood Prevention and Fish & Wildlife)

- LEGEND**
- Watershed Boundary
 - County Boundary
 - Township Boundary
 - Principal Roads & Streets
 - Railroads
 - Streams & Ponds
- REACH**

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PROJECT MAP

POWDERMILL BROOK WATERSHED

MASSACHUSETTS



WATERSHED WORK PLAN
FCR
WATERSHED PROTECTION AND FLOOD PREVENTION

POWDERMILL BROOK WATERSHED
Hampden and Hampshire Counties, Massachusetts

Prepared Under the Authority of the Watershed Protection
and Flood Prevention Act (Public Law 566, 83d Congress,
68 Stat. 666) as amended.

Prepared by:
Hampden Soil Conservation District
and
City of Westfield

With Assistance by:
U. S. Department of Agriculture, Soil Conservation Service
U. S. Department of Agriculture, Forest Service

August 1961

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SECTION 1
WATERSHED WORK PLAN
POWDERMILL BROOK WATERSHED
Massachusetts

SUMMARY OF PLAN

The Powdermill Brook Watershed drains 12,825 acres, of which 11,900 acres are in Hampden County and 925 acres in Hampshire County. All of the floodwater damages and all works of improvement included in this work plan are located in Hampden County.

The sponsoring local organizations are the Hampden Soil Conservation District and the City of Westfield.

This plan was developed jointly by the Soil Conservation Service, the U. S. Forest Service, the Hampden Soil Conservation District, and the City of Westfield. Other state and Federal agencies contributing to the plan were: Massachusetts Water Resources Commission, Massachusetts Division of Fisheries and Game, the U. S. Fish and Wildlife Service, and the U. S. Army Corps of Engineers.

Records indicate that floods causing serious damage occur about once in 12 years. Some damage to agricultural land in the flood plain is experienced more frequently. The largest flood of record occurred August 18-19, 1955. In this storm 19.8 inches of rainfall fell on the watershed in 34 hours. Runoff resulting from this storm caused direct floodwater damages of \$820,150.

The plan includes conservation land treatment measures for watershed protection, one floodwater retarding structure, and one multiple purpose floodwater retarding-fish and wildlife enhancement structure.

The works of improvement are to be installed in a five-year period at a total estimated installation cost of \$470,176. The share of this cost to be borne by Public Law 566 funds is \$282,073. The balance of \$188,103 will be borne by other funds.

Land Treatment Measures

The cost of land treatment is estimated at \$153,214, of which \$138,214 will be borne by other funds. Public Law 566 funds in the amount of \$15,000 will be used entirely for accelerated technical assistance. This sum consists of \$8,700 for use of the U. S. Forest Service, and \$6,300 for use of the Soil Conservation Service.

Structural Measures

A floodwater retarding structure will be built on the Powdermill Brook. The Arm Brook structure is a multiple purpose flood-water retarding-fish and wildlife enhancement structure. These two structures control runoff from a total of 5,076 acres of the watershed. They provide for 1,547 acre-feet of floodwater storage, 142 acre-feet of permanent storage for fish and wildlife enhancement, and 23 acre-feet of sediment storage.

The total estimated installation cost of these two structures is \$316,962, of which \$284,917 is allocated to flood prevention and \$32,045 to fish and wildlife enhancement. Of the total installation cost Public Law 566 funds will bear \$267,073. The local share of installation costs will be \$49,889. The following table shows how the installation costs are prorated:

Installation Item	<u>P. L. 566 Funds</u>		<u>Other Funds</u>		Total
	Flood Preven- tion	Fish & Wildlife Enhance- ment	Flood Preven- tion	Fish & Wildlife Enhance- ment	
Construction	186,273	8,645	--	12,354	207,272
Installation Services	64,778	7,377	--	--	72,155
Administering Contracts	--	--	1,863	210	2,073
Land, Easements & Rights-of-Way	--	--	32,003	3,459	35,462
Totals	251,051	16,022	33,866	16,023	316,962

The Massachusetts Division of Fisheries and Game will provide materials and personnel to practice fish and wildlife management at the Arm Brook site. Provisions for public access to this site will be included in the acquisition of land, easements and rights-of-way.

Damages and Benefits

The estimated average annual floodwater damage in the watershed from Powdermill Brook under present conditions is \$19,156. The future average annual damages with the project installed is estimated to be \$175.

The average annual flood prevention benefit from land treatment measures is \$1,399 and from structural measures is \$17,582. The estimated average annual flood prevention cost of these structures is \$11,360. This results in a benefit-cost ratio of 1.5 to 1. In addition, public benefits will be derived from the use of the fish and wildlife enhancement pool. These latter benefits were not evaluated monetarily.

Provisions for Financing Installation of Structures

The City of Westfield will be responsible for obtaining all necessary land, easements and rights-of-way. This cost is estimated at \$35,462. The city will also pay the local construction cost allocated to fish and wildlife enhancement in the Arm Brook structure estimated at \$12,354.

The City of Westfield will be responsible for administering the contracts for installation of structural measures.

Construction costs for flood prevention (\$186,273) and the Federal share for fish and wildlife enhancement (\$8,645) will be paid from Public Law 566 funds. Public Law 566 funds will also bear the cost of installation services (\$72,155).

Operation and Maintenance

Land treatment measures will be installed, operated, and maintained by local landowners and operators under agreements with the Hampden Soil Conservation District.

The City of Westfield will be responsible for operation and maintenance of the structural measures. This cost is estimated at \$1,200 annually. Funds for this will be provided through appropriations by the city.

DESCRIPTION OF THE WATERSHED

Physical Data

The Powdermill Brook Watershed has a drainage area of 12,825 acres (20.04 square miles) all within the Commonwealth of Massachusetts. The major portion of the watershed lies in Hampden County with only 925 acres in Hampshire County. The area includes parts of the Cities of Westfield, Holyoke, and West Springfield and the Town of Montgomery in Hampden County, and the Town of Southampton in Hampshire County.

Powdermill Brook originates in the Town of Montgomery and flows southeasterly approximately eight and five-tenths (8.5) miles through the City of Westfield to its confluence with the Westfield River. Major tributaries are Arm Brook and Sandy Mill Brook.

Topography

The Powdermill Brook Watershed lies within the Central Connecticut Valley between the eastern and western highlands. This area has been over-ridden by glaciers. Upland swamps, ponds, drumlins and terraces are very common throughout. Topographic extremes are found, varying from gentle terrain in the lower portion to steep sided V-shaped valleys in the upper reaches of Powdermill Brook. The maximum elevation in the headwaters is 940 feet and the minimum elevation is 120 feet.

Geology

The watershed is covered by a mantle of unconsolidated Pleistocene glacial deposits underlain by Triassic sandstones. Glacial till has been deposited in the form of drumlins and moraines. It varies from a few feet to several hundred feet in thickness and consists of silt, sand, gravel and boulders. Stratified deposits include both fine lacustrine deposits and coarse outwash materials. Some of these are covered by a mantle of water deposited sands and gravels. Glacial till probably underlies many of the stratified deposits.

Soils

Upland soils occupy about 30% of the watershed. Terrace soils occupy 60% of the watershed. The remainder consists of recent

alluvium, mucks, peats, and miscellaneous deposits of wind blown material.

The deep upland soils are derived from loose to very compact till. The principal well-drained series are Cheshire, Paxton, and Charlton. The shallow to bed rock soils belong to the Hollis and Sunderland series. Textures of these soils vary from loam to sandy loam.

The terrace soils are derived from stratified glaciofluvial deposits. The principal series are Merrimac, Agawam, and Hartford. Fine sandy loam and sandy loam are the predominant surface textures with sand and gravel subsoils. Large deposits of peat are to be found.

The principal soils in the flood plain are the Podunk and Rumney series and are frequently flooded. Surface textures of these soils are predominantly silt loams and very fine sandy loams. The drainage of these soils and their associated series ranges from moderately well drained to poorly drained. Deposits of peat and muck occur in this flood plain.

Climate

Average annual precipitation on the watershed is 47 inches. It is generally uniformly distributed throughout the year. Most of the precipitation during the winter season is in the form of snow.

Annual runoff from the watershed averages 23 inches. Spring runoff causes some annual flooding but major flooding is usually associated with storms of tropical origin.

The average growing season is from April 30 to October 13, 166 days.

Land Use

The major uses of land within the watershed are:

1. Woodland	8,055 acres - sixty-three percent
2. Cropland	1,635 acres - thirteen percent
3. Grassland	1,155 acres - nine percent
4. Urban	874 acres - seven percent
5. Water	260 acres - two percent
6. Other	846 acres - six percent

Second-growth hardwoods, mostly northern hardwoods and mixed oak types, occupy 62 percent of the forest area; white pine, pitch pine, and hemlock, 15 percent; and the remaining 23 percent mixed stands.

Economic Data

Approximately 12,000 people reside within the watershed. Population projections, as furnished by the Massachusetts Department of Commerce, predict that by the year 2000 there will be an increase of 61 percent.

There are approximately 325 acres in the flood plain of the Powdermill Brook and its tributaries. This represents two and one-half percent of the total watershed area. The flood plain land is used principally for agricultural, industrial and residential purposes.

There are 110 farms within the watershed averaging 65 acres and having an average value of \$26,315. Major crops grown are vegetables, dairy products, tobacco, and fruit.

There is no Federal land within the watershed. Farmers own about 4,500 acres of forest land. The rest of the forest land is devoted to resort areas and summer homes or held as an investment.

Past use of forest land is responsible for present stand-size and condition. Although largely immature, these stands have a potential for hydrologic improvement and for the production of timber crops. Sawtimber (1,500 board feet or more per acre) occupies 35 percent of the forest land, poletimber (200 cubic feet or more per acre) 61 percent, and the remaining 4 percent of the forest land is seedlings and saplings.

Given protection, care and management the forest stands are expected to contribute substantially to the future over-all economy of the watershed.

Industry within the area consists of the manufacture of machine needles, surgical needles, decorated metal products, name plates, dials, and radiators for commercial and industrial use. These industries have an estimated annual payroll in excess of \$2,500,000.

Transportation facilities are excellent. The New York, New Haven and Hartford, and the New York Central Railroads service the area. The major highways are Route 10, Route U. S. 202, and the Massachusetts Turnpike.

Utilities servicing the area include electric power, natural gas and oil.

WATERSHED PROBLEMS

Floodwater Damages

Damages in excess of \$820,000 occurred within the Powdermill Brook Watershed, as the result of the hurricane "Diane", August 18-19, 1955. This storm caused major damages to 77 homes housing 460 people, 10 industrial and commercial establishments employing 625 people, 3 farms producing high value crops, a mile of paved highway, a bridge, and 2 railroad culverts. Other storms causing major damage occurred in November 1927, March 1936, September 1938, and December 1948.

Approximately 178 acres of bottomland is subject to flooding. Fifty acres are used for intensive production of high value vegetable crops. Celery, scullions, and spinach are the main crops. The remaining acreage is used for residential and industrial purposes.

The area from Sandy Hill Road to the Westfield River is subject to flooding by backwater from the Westfield River. These damages are not attributable to the Powdermill Brook.

Sandy Mill Brook confluences with Powdermill Brook below reach 2 (see map) and does not contribute to damages in reaches 1 and 2.

Indirect damages to agriculture are: (1) loss of perishable products due to disruption of transportation facilities, (2) loss of perishable products from failure of refrigeration equipment caused by interruption of electric power.

Non-agricultural indirect damages are: (1) loss of industrial production, (2) loss of orders because of delayed shipment, (3) loss of wages to employees, (4) the high cost of re-routing rail and vehicular traffic.

Erosion Damage

Erosion damage in the watershed consists of streambank cutting, sheet and rill erosion. The magnitude of these damages is not great enough to support land treatment measures for flood prevention.

Sediment Damage

A sediment damage study of the watershed revealed a small amount of damage from swamping, scouring, and infertile overwash. These damages were evaluated as part of the floodwater damages.

Problems Relating to Water Management

The development of additional areas for recreation including fishing, hunting and nature studies is desirable. Existing facilities do not meet the current and future needs.

Agricultural water management problems, such as drainage and irrigation, are local in nature and do not require project action. The needs for drainage and irrigation are being met by individual landowners and operators under other going programs.

EXISTING OR PROPOSED WORKS OF IMPROVEMENT

There are no existing works of improvement in the watershed which provide measurable flood prevention benefits, and no flood protection measures are presently planned for this watershed.

The works of improvement as set forth in this plan will contribute to the comprehensive development of the Westfield River Basin.

WORKS OF IMPROVEMENT TO BE INSTALLED

Land Treatment Measures

Land treatment measures contained in this plan are for the purpose of watershed protection. These measures contribute to program objectives of reducing runoff and erosion by increasing infiltration rates and water retention capacity of the soil.

Acceleration of the land treatment program now being carried out by the Hampden Soil Conservation District is needed to accomplish these objectives. Land treatment is especially important for protection of these lands to support, supplement, and insure the useful life of the structural measures. The application of the land treatment measures contained in this work plan will promote conservation, development and improvement of agricultural land and water management. These measures provide for using the land within its capabilities and treat it according to its needs.

The following measures are to be installed during a five-year period:

Cropland and Pasture Practices

These land treatment measures have been developed for installation on the farm lands within the watershed. They are based on a survey of conservation needs made by the Hampden Soil Conservation District.

1. Conservation Cropping Systems (500 acres)

This practice provides for growing crops in combination with needed cultural and management measures. Cropping systems include the use of rotations that contain grasses and legumes. This practice maintains and improves the soil structure thus improving the rate of infiltration and waterholding capacity of the soil.

2. Cover Cropping (80 acres)

This practice involves the use of close growing crops between periods of regular crop production or during over-winter periods in cultivated orchards.

3. Hayland Planting (200 acres)

Establishing long term hay stands of grasses and legumes.

4. Pasture Renovation (200 acres)

The improving of permanent pasture by discing or other mechanical methods to increase vegetative cover.

5. Critical Area Planting (75 acres)

The stabilizing of silt-producing and severely eroded areas by establishing vegetative cover. This includes woody plants, such as trees, shrubs, or vines and adapted grasses or legumes established by seeding or sodding to provide long term ground cover.

6. Diversions (.5 mile)

Grading or digging a channel across the slope with a supporting ridge on the down-hill side, to intercept excessive runoff and protect areas below from erosion and overflow.

7. Grassed Waterways (5 acres)

Reshaping or grading and establishing suitable vegetation of natural waterways or depressions.

8. Grade Stabilization Structures (No. 5)

Installing a grade stabilizing structure or structures in water courses. Such structures may include drop inlets, chutes, drops or others.

9. Streambank Protection (.2 mile)

Improving the hydraulic characteristics of streams or excavated channels.

Forestry Practices

The following remedial program has been developed by the local people from a statement of land treatment needs prepared by the Massachusetts Division of Forests and Parks and the U. S. Forest Service. Land treatment needs were determined by a field survey of the watershed.

To insure proper forest land treatment and maximum watershed protection the following measures will be installed:

1. Tree Planting (60 acres)

Artificial reforestation of certain open land is necessary to adjust land use with capability and to reduce runoff and erosion by developing a protective cover and an absorbent forest floor "sponge" of humus and litter. Under such conditions the soil is protected, infiltration rates improved, soil moisture and storage capacity increased, and the land is put to its best use.

2. Hydrologic Cultural Operations (1,235 acres)

These silvicultural operations are aimed at improving hydrologic conditions by manipulation of stand composition to create conditions favorable to the maximum production and protection of litter, humus, and forest cover. They include thinnings, weedings, improvement, and harvest cuttings.

3. Skid Trail and Logging Road Erosion Control (2 miles)

The objective of this measure is to divert water from eroding skid trails and logging roads in order to reduce and control soil erosion and sedimentation. Simple water bars (ditches with pole or earthen diversions), spaced at specified intervals, are the usual means applied to slow down and divert water. Some eroding areas need revegetation to hold soil in place.

Estimated installation costs of the land treatment measures are shown in Table 1 of this work plan.

Structural Measures

One floodwater retarding structure and one multiple purpose floodwater retarding-fish and wildlife enhancement structure constitute the structural measures contained in this work plan.

These two structures control the runoff from 5,076 acres. This represents 40 percent of the entire watershed area, and 79 percent of the area contributing to the floodwater damages.

Powdermill Brook Structure

This structure is located on the Powdermill Brook approximately 800 feet upstream from the main line of the New York, New Haven and Hartford Railroad. This dam will be about 47 feet high and contain 100,000 cubic yards of earth fill. It will control 2,894 acres of drainage area and have capacity to store 4.0 inches of runoff or 966 acre-feet. The dam will have a self-regulating principal spillway consisting of a 48 inch reinforced concrete pipe conduit extending through the base of the dam, and a low, vertical, reinforced concrete drop inlet. Appurtenances to the drop inlet will include an anti-vortex device and a trash rack. This dam will not impound water except in times of excess runoff.

Arm Brook Structure

This structure is located on Arm Brook approximately 450 feet north of the Massachusetts Turnpike. This dam will be about 56 feet high and contain 77,200 cubic yards of earth fill. It will control 2,164 acres of drainage area and have capacity to store 3.3 inches of runoff or 581 acre-feet. The dam will have a self-regulating principal spillway consisting of a 42-inch reinforced concrete pipe conduit extending through the base of the dam, and a single-stage, vertical, reinforced concrete drop inlet. Appurtenances to the drop inlet will include an anti-vortex device, trash racks, and gate at the base. The top of the drop inlet will be set at an elevation to provide for sediment storage and a fish and wildlife enhancement pool. The permanent pool will have a surface area of 13 acres and a volume of 150 acre-feet.

Each dam will have, in addition to the principal spillway, a grassed emergency spillway built into one of the abutments. Emergency spillways are provided to pass storms of rare occurrence with safety to the structure. Storage capacity will be added to each structure to provide for the anticipated sediment accumulation over a fifty-year period. No relocation or modification of existing railroads, highways, bridges, homes or utilities is necessary for structure installations.

The total installation cost of these two structures is estimated to be \$316,962. These structures will contain 1,547 acre-feet of floodwater detention capacity, 142 acre-feet of storage for fish and wildlife enhancement and 23 acre-feet for sediment storage.

TABLE 1 - ESTIMATED INSTALLATION COST
Powdermill Brook Watershed
Massachusetts

Installation Cost Item	No. to be Applied		Estimated Cost (Dollars)		
	Unit	Total	PL 566 Funds	Other Funds	Total
		Non-Fed. Lands	Non-Fed. Lands	Non-Fed. Lands	
LAND TREATMENT FOR Watershed Protection					
<u>Soil Conservation Service</u>					
Conservation Cropping System	Acre	500		35,000	35,000
Cover Cropping	Acre	80		800	800
Hayland Planting	Acre	200		14,000	14,000
Pasture Renovation	Acre	200		14,000	14,000
Critical Area Planting	Acre	75		18,750	18,750
Diversions	Mile	.5		558	558
Grassed Waterways	Acre	5		1,850	1,850
Grade Stabilization Structures	No.	5		2,000	2,000
Streambank Protection	Mile	.2		2,816	2,816
Technical Assistance			6,300	4,940	11,240
SCS Subtotal			6,300	94,714	101,014
<u>Forest Service</u>					
Tree Planting	Acre	60		3,800	3,800
Hydrologic Culture Operations	Acre	1,235		30,400	30,400
Skid Trail and Logging Road					
Erosion Control	Mile	2		600	600
Technical Assistance			8,700	8,700	17,400
FS Subtotal			8,700	43,500	52,200
TOTAL LAND TREATMENT			15,000	138,214	153,214
STRUCTURAL MEASURES					
<u>Soil Conservation Service</u>					
Floodwater Retarding Structures	No.	1	100,352		100,352
Multiple Purpose Floodwater Retarding and Fish and Wildlife Enhancement Structures	No.	1	94,566	12,354	106,920
Subtotal - Construction			194,918	12,354	207,272
<u>Installation Services</u>					
<u>Soil Conservation Service</u>					
Engineering Services			52,802		52,802
Other			19,353		19,353
Subtotal - Installation Services			72,155		72,155
<u>Other Costs</u>					
Land, Easements and Rights-of-way				35,462	35,462
Administration of Contracts				2,073	2,073
Subtotal - Other Costs				37,535	37,535
TOTAL STRUCTURAL MEASURES			267,073	49,889	316,962
TOTAL PROJECT			282,073	188,103	470,176
<u>Summary</u>					
Subtotal - SCS			273,373	144,603	417,976
Subtotal - FS			8,700	43,500	52,200
TOTAL PROJECT			282,073	188,103	470,176

Price Base 1961

August 1961

BENEFITS FROM WORKS OF IMPROVEMENT

The works of improvement included in this work plan will provide flood protection to ten industrial and commercial establishments employing approximately 625 people; 77 residences housing about 460 people; 3 farms; one highway bridge; and approximately one mile of streets and highways.

The works of improvement contained in this work plan will give 98.4 percent reduction in damages caused by runoff of 3.98 inches in 6 hours. This is estimated to be a 500-year frequency storm.

The "Diane" storm of August 18th 19, 1955, produced runoff greater than that to be expected from a 500-year frequency storm. The works of improvement contained in this work plan would not provide a high level of protection from a reoccurrence of the "Diane" storm.

The combined land treatment and structural program will reduce average annual damages in the watershed from \$19,156 to \$175 or 99 percent (see Table 10). The direct floodwater damages will be reduced from \$16,053 to \$151, and the indirect floodwater damages from \$3,103 to \$24.

The reduction in direct average annual floodwater damages, by type, is as follows:

Agricultural	From \$ 2,147 to \$124 (94.2%)
Retail and Commercial	From 10,999 to 22 (99.8%)
Residential	From 2,711 to 5 (99.8%)
Road, Bridge and Utility	From 195 to 0 (100.0%)

Damages in agricultural reach No. 2 (see map) caused by floods that occur more frequently than once in 20 years will be practically eliminated. The peak flows from Powdermill Brook produced by the less frequent storms will be reduced. However, the extent of reduction was not evaluated because these flood events may coincide with backwater flooding from the Westfield River. It would be difficult to differentiate the damages caused by floods from Powdermill Brook and the backwater from Westfield River. Damages caused by the Westfield River in this reach will not be reduced by the works of improvement included in this work plan.

The fish and wildlife pool in the Arm Brook site would provide a high-quality trout habitat, and support a considerably increased angling opportunity over that provided by the inundated stream segment. Some 342,500 persons live in the watershed area

and in the nearby cities of Westfield, Holyoke, West Springfield, Chicopee and Springfield and there is a great demand by fishermen from these areas for a trout fishery of the type that could be produced in the impoundment. It is estimated that about 3,000 man-days of fishing could be provided for area fishermen annually.

COMPARISON OF BENEFITS AND COSTS

The total average annual benefits of the structural works of improvement contained in this plan are \$17,582. The average annual cost of these structural measures is \$11,360. The benefit-cost ratio of the structural measures is 1.5 to 1. Benefits for fish and wildlife enhancement are not evaluated and, therefore, neither the cost nor benefits for this purpose are included in these figures.

ACCOMPLISHING THE PLAN

Land Treatment Measures

The Hampden Soil Conservation District will assist landowners and operators cooperating with the district in the preparation and application of farm conservation plans. Before construction begins on a structure, fifty percent of the land needing protection in the drainage area above will be under cooperative agreement with the Soil Conservation District.

The Agricultural Extension Service of Massachusetts will assist the Soil Conservation District in developing and carrying out an information and educational program to stimulate interest in watershed activities.

The forest land treatment measures will be installed by the landowners with technical assistance furnished by the Massachusetts Division of Forests and Parks in cooperation with the U. S. Forest Service. Individual management plans will be prepared for at least 70 forest landowners, outlining practical measures to be applied in the immediate future to maintain and improve the hydrologic condition of their forest land. Other technical assistance is needed to assure protection of watershed values and completion of the program. Included are supplemental activities such as developing timber sale or operating contracts, laying out skid trail and logging road systems, stimulation of landowner interest and participation in the program, and general planning and supervision of the program.

The Hampden County Agricultural Stabilization and Conservation Committee through the Agricultural Conservation Program will assist by offering cost-sharing on the land treatment measures and will encourage farmers in the watershed to apply those measures included in the work plan. Funds permitting, the State Agricultural Stabilization and Conservation Committee will allocate additional ACP funds to the County for carrying out cost-sharing practices to further accelerate the installation of these land treatment measures. The actual determination of how much assistance can be provided will be made on an annual basis and will be influenced by the needs and desires of the landowners.

Technical assistance will be provided by the Soil Conservation Service with funds provided by Public Law 566 and other programs. This assistance will be provided for the installation of land treatment measures for watershed protection, including assistance needed for the development of basic conservation plans on farms in the watershed.

The land treatment measures are to be installed over a five-year period.

Structural Measures

The Soil Conservation Service will provide the installation services to design, layout and supervise construction. The Service will pay construction costs allocated to flood prevention, and P. L. 566 share of the cost of construction allocated to fish and wildlife enhancement.

The City of Westfield will be responsible for administering the contracts for installation of structural measures.

The City of Westfield will obtain, at no cost to the Federal government, all land, easements and rights-of-way necessary for installation of the structural measures. The city will pay the allocated non-Federal share of construction costs for fish and wildlife enhancement. Provisions for public access to the Arm Brook site will be included in the acquisition of land, easements and rights-of-way. No special tax levy will be made for these purposes.

The Massachusetts Division of Fisheries and Game will provide material and personnel to practice fish and game management measures in the Arm Brook site.

The sponsoring local organizations do not intend to obtain a Farmers Home Administration loan.

Federal assistance for carrying out the works of improvement described in this plan will be provided under the authority of the Watershed Protection and Flood Prevention Act, Public Law 566 (83rd Congress, 68 Stat. 666) as amended.

The structural works of improvement will be installed in one year.

The schedule for installation of land treatment and structural works of improvement is as follows:

Year	Structural Measures	Land Treatment	Total
First - P. L. 566 funds	267,073	3,000	270,073
Other funds	<u>49,889</u>	<u>27,642</u>	<u>77,531</u>
Yearly Total	316,962	30,642	347,604
Second - P. L. 566 funds	--	3,000	3,000
Other funds	<u>--</u>	<u>27,643</u>	<u>27,643</u>
Yearly Total	--	30,643	30,643
Third - P. L. 566 funds	--	3,000	3,000
Other funds	<u>--</u>	<u>27,643</u>	<u>27,643</u>
Yearly Total	--	30,643	30,643
Fourth - P. L. 566 funds	--	3,000	3,000
Other funds	<u>--</u>	<u>27,643</u>	<u>27,643</u>
Yearly Total	--	30,643	30,643
Fifth - P. L. 566 funds	--	3,000	3,000
Other funds	<u>--</u>	<u>27,643</u>	<u>27,643</u>
Yearly Total	--	30,643	30,643
Project Period Totals			
P. L. 566 funds	267,073	15,000	282,073
Other funds	<u>49,889</u>	<u>138,214</u>	<u>188,103</u>
Grand Total	\$316,962	\$153,214	\$470,176

PROVISIONS FOR OPERATION AND MAINTENANCE

Land Treatment

Land treatment measures will be maintained by the landowners or operators of the lands in cooperation with the Hampden Soil Conservation District. Technical assistance and guidance will be provided by the Soil Conservation Service and by the Massachusetts Division of Forests and Parks in cooperation with the U. S. Forest Service.

Structural Measures

The City of Westfield will be responsible for operation and maintenance of the floodwater retarding structure on Powdermill Brook and the multiple purpose floodwater retarding-fish and wildlife enhancement structure on Arm Brook. Necessary funds will be provided through appropriations by the city.

An operation and maintenance agreement will be executed between the City of Westfield and the Federal government prior to issuing the invitations to bid for the construction of the structures.

Inspections of the structural works of improvement will be made annually and after major storms as provided for in the operation and maintenance agreement. The Soil Conservation Service will provide at least one technical representative to accompany those making these inspections.

The annual cost of operating and maintaining the two structures is estimated to be \$1,200 and will consist of but not be limited to, the following:

1. Remove and burn debris.
2. Refill, smooth and vegetate rilling on embankments, spillways and drainage ways.
3. Realign disposal channel.
4. Repair damaged riprap or other works.
5. Repair fences and gates.
6. Maintain a good soil cover.

The City of Westfield will keep records of maintenance work performed and costs thereof, and report them annually to the Soil Conservation Service.

COST SHARING

The total project cost is estimated to be \$470,176. Forty percent or \$188,103 will be borne by other than Public Law 566 funds. The remaining 60 percent or \$282,073, will be provided from Public Law 566 funds.

The following costs will be paid by other than Public Law 566 funds:

1. The cost of applying land treatment measures on non-Federal land amounting to \$138,214. Of this amount \$94,714 is for cropland and pasture practices, and \$43,500 is for forestry practices.

The cost of applying land treatment measures estimated to be \$89,774 for cropland and pasture practices and \$33,960 for forestry practices will be borne by local landowners and operators.

State funds will provide \$8,700 for technical assistance on forestry practices, and tree planting stock with an estimated value of \$840.

Other state and Federal programs will provide technical assistance for cropland and pasture practices at an estimated cost of \$4,940.

It is expected that landowners and operators will utilize cost-sharing assistance made available under the Agricultural Conservation Program through the Hampden County Agricultural Stabilization and Conservation Committee. The Clarke-McNary Act and the Cooperative Forest Management Act will make substantial contributions to the program during the five-year installation period. It is further expected that such cost-sharing assistance as will be available under other Federal and State programs will be utilized.

2. The cost of providing land, easements and rights-of-way estimated to be \$35,462. This includes \$3,459 allocated to fish and wildlife enhancement in the Arm Brook site.
3. The cost of administering contracts estimated to be \$2,073. This includes \$210 allocated to fish and wildlife enhancement in the Arm Brook site.

4. The non-Federal portion of construction costs allocated to fish and wildlife enhancement in the Arm Brook site, estimated to be \$12,354.
5. The annual cost of operating and maintaining the structural works of improvement, estimated to be \$1,200. This includes \$137 allocated to fish and wildlife enhancement in the Arm Brook site.

The following costs will be paid by the Federal government from Public Law 566 funds:

1. The cost of providing the technical assistance needed to accelerate the land treatment measures on non-Federal land, estimated to be \$15,000. Of this amount \$6,300 will be used by the Soil Conservation Service and \$8,700 by the U. S. Forest Service.
2. The cost of installation services associated with the structural works of improvement, estimated to be \$72,155. This includes \$7,377 allocated to fish and wildlife enhancement in the Arm Brook site.
3. The construction cost of structural measures, estimated to be \$194,918. This includes \$8,645 allocated to fish and wildlife enhancement in the Arm Brook site.

CONFORMANCE OF PLAN TO FEDERAL LAWS AND REGULATIONS

The Powdermill Brook Watershed is a tributary of the Westfield River. The project contained herein is a logical step in the comprehensive development of the Westfield River, which is a tributary of the Connecticut River.

This work plan conforms to all applicable State and Federal laws, including provisions of the Soil Bank Act, Public Law 540, 84th Congress, as amended.

SECTION 2

INVESTIGATIONS, ANALYSES, SUPPORTING TABLES AND MAPS

LAND TREATMENT MEASURES

Total land treatment needs have been estimated by work unit personnel by studying aerial photographs of the watershed and by ocular observation of most of the land currently in farm crop production. The total program planned for installation over the five-year period was based on estimates of what the cooperators would accomplish if adequate technical assistance were available giving due consideration to the added stimulus from the watershed project. The acreage, number of cooperators and number of basic plans in the watershed area were prorated against the totals for the Soil Conservation Districts to determine the level of the going program in the watershed.

The difference between the planned program and the going program determined the accelerated program which is included in this work plan. Technical assistance needed for the accelerated program was determined by using current work unit rates for planning and application activities.

HYDRAULICS AND HYDROLOGY

General

Procedures and criteria used in the development of the hydrologic and hydraulic phases of the work plan are outlined in National Engineering Handbook, Section 4, Hydrology, Supplement A and other Soil Conservation Service technical guides and memorandums.

The "Diane" flood of August 19, 1955, was used as a basis in the damage analysis of the watershed. The discharges and damages in the watershed were increased considerably in this storm by the failure of two railroad embankments across the valley directly upstream of the damage area. This failure was caused primarily by the limited capacity of the culverts through the embankments. These two culverts have both been replaced with larger pipes which subsequent studies show to be adequate. The effect of this change was recognized in the evaluation of flood flows and damages.

Frequency Data

Rainfall versus frequency relationships were derived from U. S. Weather Bureau, Technical Paper No. 29. Soil-cover complex numbers were computed from information furnished by the Soil Conservation Service and the U.S.D.A. Forest Service. Runoff data was obtained using the above information and E&WP Unit Engineering Memorandum No. 36, Hydrology No. 4.

A monthly distribution of flood probability was developed from stream flow records in the area for agricultural damage appraisals.

Evaluation Routing

The runoff from the two year, twenty year, and one hundred year storms were stream routed to the damage areas. The watershed above the damage area was divided into nine sub-watersheds. Synthetic hydrographs were developed for each sub-watershed for the three storms. These hydrographs were stream routed through successive sub-watersheds using Wilson's method as outlined in NEH-4A. The peak discharges at the damage point were plotted to obtain a discharge frequency curve which was used in the economic evaluation of the watershed.

The effect of land treatment measures was computed using the change in complex curve number by the procedure described in E&WP Unit Memorandum No. 34, Hydrology No. 3.

The same three storms of the evaluation series were routed to determine the peak flows with the proposed project. The hydrographs were graphically flood routed through the two retarding structures by Method No. 2, NEH-5, Hydraulics. The outflow from the structures were then stream routed to the damage area by Wilson's Method. The future discharge versus frequency curve was developed using the peak flows from these three storms.

Key Storm Routings

The storm of August 18 and 19, 1955, was reproduced from local rainfall records. The recorded rainfall for this storm was 19.76 inches in 34 hours. The sub-watershed hydrographs were developed using one hour increments. These hydrographs were stream routed to the damage reaches by Wilson's Method. The storm peak discharges were checked at the new railroad culverts to determine if the embankments would be endangered. Study revealed that the capacity of the culverts is sufficient to protect the embankments for a reoccurrence of this storm. This study was based upon stream hydraulics with no excessive debris problem or other unforeseeable adverse conditions. The structures proposed in this plan would give added protection to the embankments.

The "Diane" storm was also routed under future conditions to determine the safety of the proposed structures. The storm was graphically flood routed through the sites. These routings proved that a reoccurrence of the "Diane" storm would not endanger the structures.

Rating Curves

Water surface profiles were used to develop rating curves for the damage reaches. A one-foot contour topographic map was made of the floodplain from Sandy Hill Road to North Elm Street. Cross-sections were taken from this map. Additional cross-sections were surveyed as needed above North Elm Street. Water surface profiles were computed for four discharges from Sandy Hill Road upstream to the upper railroad culvert, using the Step Method as outlined in NEH-4A. The backwater effect of the Westfield River on these profiles was considered. Rating curves were developed from these profiles.

Evaluation

An evaluation series of stage versus percent chance was prepared for each reach. The evaluation series was taken to a 500 year frequency for the residential and commercial damages. The area inundated by storms up to a 20 year frequency were plotted on the topographic map for the agricultural damage evaluation. Storms of less frequent occurrence may coincide with backwater from the Westfield River. Therefore, no evaluation was made for storms of greater magnitude. Agricultural benefits would be derived from larger storms which do not coincide with backwater from the Westfield River. These benefits have not been evaluated.

Structures

The 100 year floodwater detention requirements for the two floodwater retarding structures were determined by the procedure in Technical Release No. 10. The maximum volume of storage required was based on a 55 hour and a 70 hour storm for the Arm Brook site and Powdermill Brook site respectively. These requirements were greater than those determined by routing the 6 hour, 100 year rainfall hydrograph through the sites using antecedent moisture condition III. Hydrographs for emergency spillway and freeboard design were developed following the recommended criteria in E&WP Unit Memorandum No. 47, Hydrology No. 7.

ECONOMICS

Damage Appraisals

A complete damage survey was conducted within the flood plain of the Powdermill Watershed. Ninety-eight appraisals, keyed to the flood stage of hurricane "Diane", August 19, 1955, were collected. Damage estimates were made by one-foot increments below the stage of the key storm to the elevation where there was no remaining property damage. Damages were estimated at a 1961 price base and converted to long-term price projections.

Some sediment damage occurs to agricultural land within the watershed. This was included in the floodwater damage appraisal and not considered separately.

The indirect damages were estimated to be 20% of the direct damages for residential and commercial and 15% for agricultural in accord with Chapter 3, Economics Guide.

Evaluation

Average annual damages and benefits were computed using the frequency method described in Chapter 3 of the Economics Guide.

The floodwater retarding structure and the floodwater retarding-fish and wildlife enhancement structure were evaluated as one unit because of their interdependence to a common damage center

Residential, commercial and utility damages were tabulated for each hydraulic reach. They were evaluated up to a 500 year storm.

Agricultural damages are confined within Reach 2 and were evaluated separately. Present cropping pattern, yield levels and cultural practices were obtained from local farmers, Soil Conservation Service technicians, State and Federal market service and extension service. Damage rates were established by fifteen-day intervals for the growing season. Monetary values were computed in accordance with Economic Guide.

Agricultural damages were evaluated only up to the 20 year storm due to the possible effect of backwater from the Westfield River.

Cost Allocation

The Arm Brook structure will be multiple purpose for flood prevention and fish and wildlife enhancement. Allocation of costs by purposes were computed by the use-of-facilities method. The structure provides for 8 acre-feet for sediment storage, 142 acre-feet for fish and wildlife purposes, and 581 acre-feet for floodwater storage. The sediment storage was prorated to flood prevention and fish and wildlife enhancement in proportion to the storage provided for each of these purposes.

Computation of Total Cost Allocation			
	Flood Preven- tion	Fish and Wildlife Enhance- ment	Total
1. Capacity, including allocated sediment	587.43	143.57	731
2. Percentages to be used for joint costs	80.36	19.64	100
3. Total allocated costs*	\$131,118	\$32,045	\$163,163

*There were no specific costs for this structure.

The cost of each installation item is allocated to each purpose using the same percentages as were used to allocate the total cost, as follows:

Computation of Allocation of Cost of Installation Items by Purpose			
Installation Item	Flood Preven- tion (80.36%)	Fish and Wildlife Enhance- ment (19.64%)	Total
1. Construction	85,921	20,999	106,920
2. Installation Services	30,185	7,377	37,562
3. Administering Contracts	859	210	1,069
4. Land, easements & rights-of-way	14,153	3,459	17,612
Totals	131,118	32,045	163,163

Of the \$32,045 allocated to fish and wildlife enhancement, \$16,022 will be provided from Public Law 566 funds and \$16,023 from other funds.

Computation of Cost Sharing						
Installation Item	P. L. 566 Funds			Other Funds		
	Flood Prevention	Fish & Wildlife Enhancement	Total	Flood Prevention	Fish & Wildlife Enhancement	Total
1. Construction	85,921	8,645	94,566	-	12,354	12,354
2. Installation Services	30,185	7,377	37,562	-	-	-
3. Administering Contracts	-	-	-	859	210	1,069
4. Land, easements & rights-of-way	-	-	-	14,153	3,459	17,612
Totals	116,106	16,022	132,128	15,012	16,023	31,035

Land, Easements and Rights-of-way

The local organization estimated the cost at \$238 per acre. This is an average cost per acre for all property needed to install structural measures. It also includes estimated cost of fees and services.

GEOLOGY

Structure Site Investigation

A preliminary examination of the proposed sites reveals many similar characteristics. Both sites are located in an area of intense glaciation. The unconsolidated material consists of till and stratified deposits of glacio-lacustrine origin. The till ranges from clays and silts to large boulders several feet in thickness. Valley bottoms range from a mantle of compressible alluvial silts and clays to sands and gravels. It is possible that the compressibility of materials may require intense investigation.

Arm Brook site is planned to be a multiple-purpose structure. Preliminary geologic investigation revealed an impermeable layer of silts which would prevent excessive leakage.

Sediment and Erosion Studies

Sediment damage in the watershed is negligible being confined to infertile overwash and some scouring. These sediment damages were not of sufficient extent to warrant a detailed survey and are included as floodwater damages.

The Probable Soil Loss Formula was used in computing the sediment storage requirement for each structure. Trap efficiency was obtained from the trap efficiency curve ESNE-29 using the medium curve.

STRUCTURE INVESTIGATION

Floodwater Retarding and Multiple Purpose Structures

The engineering, hydrologic, geologic, and economic studies made of this watershed led to the selection of the two structures described in this plan as the best solution to the flood problems.

The structures were proportioned in accordance with Soil Conservation Service criteria defined in SCS Engineering Memorandum 27 (Revised) and as recommended in E&WP Engineering Memorandum #47, Hydrology #7. The procedures used are described in National Engineering Handbook, Section 5 and Technical Release #2.

Principal Spillways

The reinforced concrete pipe principal spillways were proportioned to produce outflows consistent with available storage and the downstream channel capacity. Both sites have one-stage, reinforced concrete risers. The riser crest for the Powdermill site is set at an elevation which will provide for an estimated 50-year sediment accumulation. An opening of the bottom of the riser will provide for passing normal flow. The crest of the Arm Brook riser is at an elevation which will provide for storage desired for fish and wildlife enhancement in addition to 50-year sediment accumulation.

Emergency Spillways

The emergency spillways will have a short length of level section, an entrance channel on an adverse grade, and an exit channel on a steep slope. The exit channels are straight until they are beyond the downstream toe of the dam.

The emergency spillways were proportioned by the procedure outlined in Technical Release #2. The proportions were then checked by a graphical flood routing. The stage discharge curve was prepared from water-surface profiles for various discharges.

Field Surveys

Transit and plane table were used in making topographic surveys of the two structure sites, and in running centerline profiles of the two dams. The topographic surveys were used to develop stage-storage and stage-area curves for the structural layouts. Profiles of the centerline of the dams were used in estimating earth fill quantities.

TABLE 2 - ESTIMATED STRUCTURE COST DISTRIBUTION
Powdermill Brook Watershed
Massachusetts

Structure Site Name	Installation Costs - PL 566 Funds				Installation Costs - Other Funds				Total Instal- lation Cost	
	Construction		Instal. Services		Engineers Estimate	Contin- gencies	Adm. of Contract	Other Easements & R. of W. Funds		
	Engineers Estimate	Other Funds	Engineers Estimate	Other Funds						
Arm Brook	78,805	15,761	27,579	9,983	10,295	2,059	1,069	17,612	31,035	163,163
Powdermill Brook	89,600	10,752	25,223	9,370			1,004	17,850	18,854	153,799
GRAND TOTAL	168,405	26,513	52,802	19,353	10,295	2,059	2,073	35,462	49,889	316,962

Price Base 1961

August 1961

TABLE 3 - STRUCTURE DATA
Floodwater Retarding Structures
Powdermill Brook Watershed - Massachusetts

ITEM	UNIT	ARM	POWDERMILL TOTAL	
Drainage Area	Sq. Mi.	3.4	4.6	8.0
<u>Storage Capacity</u>				
Sediment	Ac. Ft.	8	15	23
Fish and Wildlife	Ac. Ft.	142	---	142
Floodwater Detention	Ac. Ft.	581	966	1,547
Total	Ac. Ft.	731	981	1,712
<u>Surface Area</u>				
Sediment Pool	Ac.	2	5	7
Fish and Wildlife Pool	Ac.	13	----	13
Flood Detention Pool	Ac.	56	56	112
Volume of Fill	Cu. Yds.	77,200	100,000	177,200
Elevation Top of Dam	Ft.	218.5	202.5	---
Maximum Height of Dam	Ft.	256	47	---
<u>Emergency Spillway</u>				
Crest Elevation	Ft.	213.5	197.0	---
Bottom Width	Ft.	184	260	---
Type	-	Earth	Earth	---
Percent Chance of Use	-	1.0	1.0	---
Aver. Curve No.-Con'd II	-	68	68	---
<u>Emergency Spillway Hydrograph</u>				
Storm rainfall (6 hr.)	In.	15.2	15.0	---
Storm runoff	In.	10.7	10.5	---
Velocity of Flow (v_c) <u>1/</u>	Ft./sec.	8.0	8.0	---
Discharge rate <u>1/</u>	c.f.s.	3,060	4,200	---
Max. w.s. elev. <u>1/</u>	Ft.	217.0	200.5	---
<u>Freeboard Hydrograph</u>				
Storm rainfall (6 hr.)	In.	21.7	21.4	---
Storm runoff	In.	16.9	16.6	---
Velocity of Flow (v_c) <u>1/</u>	Ft./sec.	9.0	9.5	---
Discharge rate <u>1/</u>	c.f.s.	5,540	7,900	---
Max. w.s. elev. <u>1/</u>	Ft.	218.5	202.3	---
<u>Principal Spillway</u>				
Capacity at E.S. Crest	c.f.s.	271	330	---
<u>Capacity Equivalents</u>				
Sediment volume	In.	0.04	0.06	---
Detention volume	In.	3.3	4.0	---
Spillway storage	In.	1.1	0.8	---
Class of Structure	-	c	c	---

1/ - Maximum during passage of hydrograph.

TABLE 4 - SUMMARY OF PHYSICAL DATA
Powdermill Brook Watershed
Massachusetts

Item	Unit	Future Without Project	Future With Project
Watershed Area	Sq. Mi.	20.0	---
Watershed Area	Acre	12,825	---
Area Privately Owned	Acre	12,055	11,906
Area Non-Federal Public	Acre	770	919
Area of Cropland	Acre	1,339	1,339
Area of Woodland	Acre	7,725	7,712
Area of Grassland	Acre	1,025	1,025
Area of Farmstead & Urban	Acre	1,885	1,885
Area in Ponds, Streams, Lakes, etc.	Acre	260	273
Area of Brush & Idle	Acre	591	591
Average Annual Rainfall	Inches	47	---

August 1961

TABLE 5 - SUMMARY OF PLAN DATA
Powdermill Brook Watershed
Massachusetts

ITEM	UNIT	QUANTITY
Years to Complete Project	Year	5
Total Installation Cost		
Public Law 566 Funds	Dollar	282,073
Other Funds	Dollar	188,103
Annual O & M Cost		
Non-Federal	Dollar	1,200
Average Annual Monetary Benefits <u>1/</u>	Dollar	17,582
Agricultural	Percent	10.6
Non-Agricultural	Percent	89.4
Structural Measures		
Floodwater Retarding Structures	Each	1
Multiple Purpose Structures	Each	1
Area Inundated by Retarding Structures		
Sediment Pool	Acre	7
Fish and Wildlife Pool	Acre	13
Detention Pool	Acre	112
Watershed Above Retarding Structures	Acre	5,076
Reduction of Floodwater Damage	Dollar	18,981
By Land Treatment Measures for		
Watershed Protection	Dollar	1,399
By Structural Measures	Dollar	17,582

1/ From Structural Measures

Price Base 1961

August 1961

TABLE 6 - ANNUAL COSTS
Powdermill Brook Watershed
Massachusetts

Measures	Amortization of Installation Costs	O & M Costs Non-Federal	Other Economic Costs	Total
Evaluation Unit No. 1 Floodwater Retarding Structure: Powdermill Brook	5,558	500		6,058
Multiple Purpose Floodwater Retarding and Fish and Wildlife Enhancement Structure: Arm Brook	4,739	563		5,302*
TOTAL	10,297	1,063**		11,360

Amortized at 2 5/8% for 50 years.

* Does not include \$1,158 amortized installation costs and \$137 annual operation and maintenance for fish and wildlife enhancement.

** O and M long term price level as projected by Agricultural Research Service, Price Projection, September 1957.

August 1961

TABLE 7 - MONETARY BENEFITS FROM STRUCTURAL MEASURES
Powdermill Brook Watershed
Massachusetts

Item	Dollars 1/			Average Annual Monetary Benefits
	Estimated Average Annual Damages			
	Without	After Land	With	
	Project	Treatment For W/S Protection	Project	
Floodwater Damages				
Agricultural 2/	2,148	1,984	124	1,860
Retail & Commercial	10,999	10,201	22	10,179
Residential	2,711	2,515	5	2,510
Bridge, Road, etc.	195	180	0	180
Subtotal	16,053	14,880	151	14,729
Indirect Damages	3,103	2,877	24	2,853
Total All Damages	19,156	17,757	175	17,582

1/ Price base long term price level as projected by Agricultural Research Service, Price Projection, September 1957.

2/ Damages were not evaluated for flood events less frequent than the 20-year flood (see page 14).

August 1961

TABLE 8 - BENEFIT-COST ANALYSIS
Powdermill Brook Watershed
Massachusetts

Measures	Average Annual Benefits				Average Annual Cost	Benefit Cost Ratio	
	Flood Prevention		Non-Agr. Water Mgmt.				
	Floodwater	Indirect	Changed Land Use	Fish & Wildlife Enhancement			Total
<u>EVALUATION UNIT NO. 1</u>							
1 Floodwater Retarding Structure:							
Powdermill Brook							
1 Multiple Purpose Floodwater Retarding and Fish & Wildlife Enhancement Structure:							
Arm Brook							
Total	14,729	2,853	---	---	17,582	11,360	
GRAND TOTAL	14,729	2,853	---	---	17,582	11,360	
						1.5 to 1	

* Benefits for fish and wildlife are not evaluated and, therefore, neither the cost nor benefits for this purpose appear in the benefit cost ratio.

Price base long term price level as projected by Agricultural Research Service, Price Projection, September 1957.

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TABLE 9
 ALLOCATION OF INSTALLATION COSTS OF STRUCTURAL MEASURES
 Powdermill Brook Watershed
 Massachusetts
 (Dollars)

Item	Purpose		Total
	Flood Preven- tion	Fish & Wildlife Enhance- ment	
STEP A			
One Floodwater Retarding Structure (Powdermill)	153,799	---	153,799
One Multiple Purpose Flood- water Retarding and Fish & Wildlife Enhancement Structure (Arm)	131,118	32,045	163,163
TOTAL	284,917	32,045	316,962
STEP B			
P. L. 566	251,051	16,022	267,073
Other	33,866	16,023	49,889
TOTAL	284,917	32,045	316,962

Price Base 1961

August 1961

TABLE 10 - BENEFITS FROM WORKS OF IMPROVEMENT BY REACHES
Powdermill Brook Watershed
Massachusetts

Damage Reach	Drainage Area Above Reach Acres	Discharge At Which Damage Begins c.f.s.	Present Conditions			Future Conditions		
			Peak Flow 100-Year Flood c.f.s.	Damages 100-Year Flood Dollars	Average Annual Damages Dollars	Peak Flow 100-Year Flood c.f.s.	Damages 100-Year Flood Dollars	Average Annual Damages Dollars
1	5,700	1,850	2,365	116,500	3,707	780	0	0
2	6,400	550	2,400	96,490	15,449	800	1,148*	175

* Agricultural

August 1961

Westfield - Powdermill Brook Watershed - July 1962



1962 Reports

Watershed Work Plan for Flood Prevention.

City/Town	Westfield
City/Town	Westfield City
Dam	Arm Book Dam
Dam	Powdermill Brook Dam
Water	Sandy Hill Brook
Water	Powdermill Brook
Water	Arm Brook

WATERSHED WORK PLAN
FOR
WATERSHED PROTECTION AND FLOOD PREVENTION

POWDERMILL BROOK WATERSHED
Hampden and Hampshire Counties, Massachusetts

Prepared Under the Authority of the Watershed Protection
and Flood Prevention Act (Public Law 566, 83d Congress,
68 Stat. 666) as amended.

Prepared by:
Hampden Soil Conservation District
and
City of Westfield

With Assistance by:
U. S. Department of Agriculture, Soil Conservation Service
U. S. Department of Agriculture, Forest Service

August 1961

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SECTION 1

WATERSHED WORK PLAN

POWDERMILL BROOK WATERSHED

Massachusetts

SUMMARY OF PLAN

The Powdermill Brook Watershed drains 12,825 acres, of which 11,900 acres are in Hampden County and 925 acres in Hampshire County. All of the floodwater damages and all works of improvement included in this work plan are located in Hampden County.

The sponsoring local organizations are the Hampden Soil Conservation District and the City of Westfield.

This plan was developed jointly by the Soil Conservation Service, the U. S. Forest Service, the Hampden Soil Conservation District, and the City of Westfield. Other state and Federal agencies contributing to the plan were: Massachusetts Water Resources Commission, Massachusetts Division of Fisheries and Game, the U. S. Fish and Wildlife Service, and the U. S. Army Corps of Engineers.

Records indicate that floods causing serious damage occur about once in 12 years. Some damage to agricultural land in the flood plain is experienced more frequently. The largest flood of record occurred August 18-19, 1955. In this storm 19.8 inches of rainfall fell on the watershed in 34 hours. Runoff resulting from this storm caused direct floodwater damages of \$820,150.

The plan includes conservation land treatment measures for watershed protection, one floodwater retarding structure, and one multiple purpose floodwater retarding-fish and wildlife enhancement structure.

The works of improvement are to be installed in a five-year period at a total estimated installation cost of \$470,176. The share of this cost to be borne by Public Law 566 funds is \$282,073. The balance of \$188,103 will be borne by other funds.

Land Treatment Measures

The cost of land treatment is estimated at \$153,214, of which \$138,214 will be borne by other funds. Public Law 566 funds in the amount of \$15,000 will be used entirely for accelerated technical assistance. This sum consists of \$8,700 for use of the U. S. Forest Service, and \$6,300 for use of the Soil Conservation Service.

Structural Measures

A floodwater retarding structure will be built on the Powdermill Brook. The Arm Brook structure is a multiple purpose flood-water retarding-fish and wildlife enhancement structure. These two structures control runoff from a total of 5,076 acres of the watershed. They provide for 1,547 acre-feet of floodwater storage, 142 acre-feet of permanent storage for fish and wildlife enhancement, and 23 acre-feet of sediment storage.

The total estimated installation cost of these two structures is \$316,962, of which \$284,917 is allocated to flood prevention and \$32,045 to fish and wildlife enhancement. Of the total installation cost Public Law 566 funds will bear \$267,073. The local share of installation costs will be \$49,889. The following table shows how the installation costs are prorated:

Installation Item	<u>P. L. 566 Funds</u>		<u>Other Funds</u>		Total
	Flood Preven- tion	Fish & Wildlife Enhance- ment	Flood Preven- tion	Fish & Wildlife Enhance- ment	
Construction	186,273	8,645	--	12,354	207,272
Installation					
Services	64,778	7,377	--	--	72,155
Administering					
Contracts	--	--	1,863	210	2,073
Land, Easements & Rights-of-Way	--	--	32,003	3,459	35,462
Totals	251,051	16,022	33,866	16,023	316,962

The Massachusetts Division of Fisheries and Game will provide materials and personnel to practice fish and wildlife management at the Arm Brook site. Provisions for public access to this site will be included in the acquisition of land, easements and rights-of-way.

Damages and Benefits

The estimated average annual floodwater damage in the watershed from Powdermill Brook under present conditions is \$19,156. The future average annual damages with the project installed is estimated to be \$175.

The average annual flood prevention benefit from land treatment measures is \$1,399 and from structural measures is \$17,582. The estimated average annual flood prevention cost of these structures is \$11,360. This results in a benefit-cost ratio of 1.5 to 1. In addition, public benefits will be derived from the use of the fish and wildlife enhancement pool. These latter benefits were not evaluated monetarily.

Provisions for Financing Installation of Structures

The City of Westfield will be responsible for obtaining all necessary land, easements and rights-of-way. This cost is estimated at \$35,462. The city will also pay the local construction cost allocated to fish and wildlife enhancement in the Arm Brook structure estimated at \$12,354.

The City of Westfield will be responsible for administering the contracts for installation of structural measures.

Construction costs for flood prevention (\$186,273) and the Federal share for fish and wildlife enhancement (\$8,645) will be paid from Public Law 566 funds. Public Law 566 funds will also bear the cost of installation services (\$72,155).

Operation and Maintenance

Land treatment measures will be installed, operated, and maintained by local landowners and operators under agreements with the Hampden Soil Conservation District.

The City of Westfield will be responsible for operation and maintenance of the structural measures. This cost is estimated at \$1,200 annually. Funds for this will be provided through appropriations by the city.

DESCRIPTION OF THE WATERSHED

Physical Data

The Powdermill Brook Watershed has a drainage area of 12,825 acres (20.04 square miles) all within the Commonwealth of Massachusetts. The major portion of the watershed lies in Hampden County with only 925 acres in Hampshire County. The area includes parts of the Cities of Westfield, Holyoke, and West Springfield and the Town of Montgomery in Hampden County, and the Town of Southampton in Hampshire County.

Powdermill Brook originates in the Town of Montgomery and flows southeasterly approximately eight and five-tenths (8.5) miles through the City of Westfield to its confluence with the Westfield River. Major tributaries are Arm Brook and Sandy Mill Brook.

Topography

The Powdermill Brook Watershed lies within the Central Connecticut Valley between the eastern and western highlands. This area has been over-ridden by glaciers. Upland swamps, ponds, drumlins and terraces are very common throughout. Topographic extremes are found, varying from gentle terrain in the lower portion to steep sided V-shaped valleys in the upper reaches of Powdermill Brook. The maximum elevation in the headwaters is 940 feet and the minimum elevation is 120 feet.

Geology

The watershed is covered by a mantle of unconsolidated Pleistocene glacial deposits underlain by Triassic sandstones. Glacial till has been deposited in the form of drumlins and moraines. It varies from a few feet to several hundred feet in thickness and consists of silt, sand, gravel and boulders. Stratified deposits include both fine lacustrine deposits and coarse outwash materials. Some of these are covered by a mantle of water deposited sands and gravels. Glacial till probably underlies many of the stratified deposits.

Soils

Upland soils occupy about 30% of the watershed. Terrace soils occupy 60% of the watershed. The remainder consists of recent

alluvium, mucks, peats, and miscellaneous deposits of wind blown material.

The deep upland soils are derived from loose to very compact till. The principal well-drained series are Cheshire, Paxton, and Charlton. The shallow to bed rock soils belong to the Hollis and Sunderland series. Textures of these soils vary from loam to sandy loam.

The terrace soils are derived from stratified glaciofluvial deposits. The principal series are Merrimac, Agawam, and Hartford. Fine sandy loam and sandy loam are the predominant surface textures with sand and gravel subsoils. Large deposits of peat are to be found.

The principal soils in the flood plain are the Podunk and Rumney series and are frequently flooded. Surface textures of these soils are predominantly silt loams and very fine sandy loams. The drainage of these soils and their associated series ranges from moderately well drained to poorly drained. Deposits of peat and muck occur in this flood plain.

Climate

Average annual precipitation on the watershed is 47 inches. It is generally uniformly distributed throughout the year. Most of the precipitation during the winter season is in the form of snow.

Annual runoff from the watershed averages 23 inches. Spring runoff causes some annual flooding but major flooding is usually associated with storms of tropical origin.

The average growing season is from April 30 to October 13, 166 days.

Land Use

The major uses of land within the watershed are:

1. Woodland	8,055 acres - sixty-three percent
2. Cropland	1,635 acres - thirteen percent
3. Grassland	1,155 acres - nine percent
4. Urban	874 acres - seven percent
5. Water	260 acres - two percent
6. Other	846 acres - six percent

Second-growth hardwoods, mostly northern hardwoods and mixed oak types, occupy 62 percent of the forest area; white pine, pitch pine, and hemlock, 15 percent; and the remaining 23 percent mixed stands.

Economic Data

Approximately 12,000 people reside within the watershed. Population projections, as furnished by the Massachusetts Department of Commerce, predict that by the year 2000 there will be an increase of 61 percent.

There are approximately 325 acres in the flood plain of the Powdermill Brook and its tributaries. This represents two and one-half percent of the total watershed area. The flood plain land is used principally for agricultural, industrial and residential purposes.

There are 110 farms within the watershed averaging 65 acres and having an average value of \$26,315. Major crops grown are vegetables, dairy products, tobacco, and fruit.

There is no Federal land within the watershed. Farmers own about 4,500 acres of forest land. The rest of the forest land is devoted to resort areas and summer homes or held as an investment.

Past use of forest land is responsible for present stand-size and condition. Although largely immature, these stands have a potential for hydrologic improvement and for the production of timber crops. Sawtimber (1,500 board feet or more per acre) occupies 35 percent of the forest land, poletimber (200 cubic feet or more per acre) 61 percent, and the remaining 4 percent of the forest land is seedlings and saplings.

Given protection, care and management the forest stands are expected to contribute substantially to the future over-all economy of the watershed.

Industry within the area consists of the manufacture of machine needles, surgical needles, decorated metal products, name plates, dials, and radiators for commercial and industrial use. These industries have an estimated annual payroll in excess of \$2,500,000.

Transportation facilities are excellent. The New York, New Haven and Hartford, and the New York Central Railroads service the area. The major highways are Route 10, Route U. S. 202, and the Massachusetts Turnpike.

Utilities servicing the area include electric power, natural gas and oil.

WATERSHED PROBLEMS

Floodwater Damages

Damages in excess of \$820,000 occurred within the Powdermill Brook Watershed, as the result of the hurricane "Diane", August 18-19, 1955. This storm caused major damages to 77 homes housing 460 people, 10 industrial and commercial establishments employing 625 people, 3 farms producing high value crops, a mile of paved highway, a bridge, and 2 railroad culverts. Other storms causing major damage occurred in November 1927, March 1936, September 1938, and December 1948.

Approximately 178 acres of bottomland is subject to flooding. Fifty acres are used for intensive production of high value vegetable crops. Celery, scullions, and spinach are the main crops. The remaining acreage is used for residential and industrial purposes.

The area from Sandy Hill Road to the Westfield River is subject to flooding by backwater from the Westfield River. These damages are not attributable to the Powdermill Brook.

Sandy Mill Brook confluentes with Powdermill Brook below reach 2 (see map) and does not contribute to damages in reaches 1 and 2.

Indirect damages to agriculture are: (1) loss of perishable products due to disruption of transportation facilities, (2) loss of perishable products from failure of refrigeration equipment caused by interruption of electric power.

Non-agricultural indirect damages are: (1) loss of industrial production, (2) loss of orders because of delayed shipment, (3) loss of wages to employees, (4) the high cost of re-routing rail and vehicular traffic.

Erosion Damage

Erosion damage in the watershed consists of streambank cutting, sheet and rill erosion. The magnitude of these damages is not great enough to support land treatment measures for flood prevention.

Sediment Damage

A sediment damage study of the watershed revealed a small amount of damage from swamping, scouring, and infertile overwash. These damages were evaluated as part of the floodwater damages.

Problems Relating to Water Management

The development of additional areas for recreation including fishing, hunting and nature studies is desirable. Existing facilities do not meet the current and future needs.

Agricultural water management problems, such as drainage and irrigation, are local in nature and do not require project action. The needs for drainage and irrigation are being met by individual landowners and operators under other going programs.

EXISTING OR PROPOSED WORKS OF IMPROVEMENT

There are no existing works of improvement in the watershed which provide measurable flood prevention benefits, and no flood protection measures are presently planned for this watershed.

The works of improvement as set forth in this plan will contribute to the comprehensive development of the Westfield River Basin.

WORKS OF IMPROVEMENT TO BE INSTALLED

Land Treatment Measures

Land treatment measures contained in this plan are for the purpose of watershed protection. These measures contribute to program objectives of reducing runoff and erosion by increasing infiltration rates and water retention capacity of the soil.

Acceleration of the land treatment program now being carried out by the Hampden Soil Conservation District is needed to accomplish these objectives. Land treatment is especially important for protection of these lands to support, supplement, and insure the useful life of the structural measures. The application of the land treatment measures contained in this work plan will promote conservation, development and improvement of agricultural land and water management. These measures provide for using the land within its capabilities and treat it according to its needs.

The following measures are to be installed during a five-year period:

Cropland and Pasture Practices

These land treatment measures have been developed for installation on the farm lands within the watershed. They are based on a survey of conservation needs made by the Hampden Soil Conservation District.

1. Conservation Cropping Systems (500 acres)

This practice provides for growing crops in combination with needed cultural and management measures. Cropping systems include the use of rotations that contain grasses and legumes. This practice maintains and improves the soil structure thus improving the rate of infiltration and waterholding capacity of the soil.

2. Cover Cropping (80 acres)

This practice involves the use of close growing crops between periods of regular crop production or during over-winter periods in cultivated orchards.

3. Hayland Planting (200 acres)

Establishing long term hay stands of grasses and legumes.

4. Pasture Renovation (200 acres)

The improving of permanent pasture by discing or other mechanical methods to increase vegetative cover.

5. Critical Area Planting (75 acres)

The stabilizing of silt-producing and severely eroded areas by establishing vegetative cover. This includes woody plants, such as trees, shrubs, or vines and adapted grasses or legumes established by seeding or sodding to provide long term ground cover.

6. Diversions (.5 mile)

Grading or digging a channel across the slope with a supporting ridge on the down-hill side, to intercept excessive runoff and protect areas below from erosion and overflow.

7. Grassed Waterways (5 acres)

Reshaping or grading and establishing suitable vegetation of natural waterways or depressions.

8. Grade Stabilization Structures (No. 5)

Installing a grade stabilizing structure or structures in water courses. Such structures may include drop inlets, chutes, drops or others.

9. Streambank Protection (.2 mile)

Improving the hydraulic characteristics of streams or excavated channels.

Forestry Practices

The following remedial program has been developed by the local people from a statement of land treatment needs prepared by the Massachusetts Division of Forests and Parks and the U. S. Forest Service. Land treatment needs were determined by a field survey of the watershed.

To insure proper forest land treatment and maximum watershed protection the following measures will be installed:

1. Tree Planting (60 acres)

Artificial reforestation of certain open land is necessary to adjust land use with capability and to reduce runoff and erosion by developing a protective cover and an absorbent forest floor "sponge" of humus and litter. Under such conditions the soil is protected, infiltration rates improved, soil moisture and storage capacity increased, and the land is put to its best use.

2. Hydrologic Cultural Operations (1,235 acres)

These silvicultural operations are aimed at improving hydrologic conditions by manipulation of stand composition to create conditions favorable to the maximum production and protection of litter, humus, and forest cover. They include thinnings, weedings, improvement, and harvest cuttings.

3. Skid Trail and Logging Road Erosion Control (2 miles)

The objective of this measure is to divert water from eroding skid trails and logging roads in order to reduce and control soil erosion and sedimentation. Simple water bars (ditches with pole or earthen diversions), spaced at specified intervals, are the usual means applied to slow down and divert water. Some eroding areas need revegetation to hold soil in place.

Estimated installation costs of the land treatment measures are shown in Table 1 of this work plan.

Structural Measures

One floodwater retarding structure and one multiple purpose floodwater retarding-fish and wildlife enhancement structure constitute the structural measures contained in this work plan.

These two structures control the runoff from 5,076 acres. This represents 40 percent of the entire watershed area, and 79 percent of the area contributing to the floodwater damages.

Powdermill Brook Structure

This structure is located on the Powdermill Brook approximately 800 feet upstream from the main line of the New York, New Haven and Hartford Railroad. This dam will be about 47 feet high and contain 100,000 cubic yards of earth fill. It will control 2,894 acres of drainage area and have capacity to store 4.0 inches of runoff or 966 acre-feet. The dam will have a self-regulating principal spillway consisting of a 48 inch reinforced concrete pipe conduit extending through the base of the dam, and a low, vertical, reinforced concrete drop inlet. Appurtenances to the drop inlet will include an anti-vortex device and a trash rack. This dam will not impound water except in times of excess runoff.

Arm Brook Structure

This structure is located on Arm Brook approximately 450 feet north of the Massachusetts Turnpike. This dam will be about 56 feet high and contain 77,200 cubic yards of earth fill. It will control 2,164 acres of drainage area and have capacity to store 3.3 inches of runoff or 581 acre-feet. The dam will have a self-regulating principal spillway consisting of a 42-inch reinforced concrete pipe conduit extending through the base of the dam, and a single-stage, vertical, reinforced concrete drop inlet. Appurtenances to the drop inlet will include an anti-vortex device, trash racks, and gate at the base. The top of the drop inlet will be set at an elevation to provide for sediment storage and a fish and wildlife enhancement pool. The permanent pool will have a surface area of 13 acres and a volume of 150 acre-feet.

Each dam will have, in addition to the principal spillway, a grassed emergency spillway built into one of the abutments. Emergency spillways are provided to pass storms of rare occurrence with safety to the structure. Storage capacity will be added to each structure to provide for the anticipated sediment accumulation over a fifty-year period. No relocation or modification of existing railroads, highways, bridges, homes or utilities is necessary for structure installations.

The total installation cost of these two structures is estimated to be \$316,962. These structures will contain 1,547 acre-feet of floodwater detention capacity, 142 acre-feet of storage for fish and wildlife enhancement and 23 acre-feet for sediment storage.

TABLE 1 - ESTIMATED INSTALLATION COST
Powdermill Brook Watershed
Massachusetts

Installation Cost Item	No. to be Applied		Estimated Cost (Dollars)		
	Unit	Total	PL 566 Funds	Other Funds	Total
		Non-Fed. Lands	Non-Fed. Lands	Non-Fed. Lands	
<u>LAND TREATMENT FOR</u>					
<u>Watershed Protection</u>					
<u>Soil Conservation Service</u>					
Conservation Cropping System	Acre	500		35,000	35,000
Cover Cropping	Acre	80		800	800
Hayland Planting	Acre	200		14,000	14,000
Pasture Renovation	Acre	200		14,000	14,000
Critical Area Planting	Acre	75		18,750	18,750
Diversions	Mile	.5		558	558
Grassed Waterways	Acre	5		1,850	1,850
Grade Stabilization Structures	No.	5		2,000	2,000
Streambank Protection	Mile	.2		2,816	2,816
Technical Assistance			6,300	4,940	11,240
SCS Subtotal			6,300	94,714	101,014
<u>Forest Service</u>					
Tree Planting	Acre	60		3,800	3,800
Hydrologic Culture Operations	Acre	1,235		30,400	30,400
Skid Trail and Logging Road					
Erosion Control	Mile	2		600	600
Technical Assistance			8,700	8,700	17,400
FS Subtotal			8,700	43,500	52,200
TOTAL LAND TREATMENT			15,000	138,214	153,214
<u>STRUCTURAL MEASURES</u>					
<u>Soil Conservation Service</u>					
Floodwater Retarding Structures	No.	1	100,352		100,352
Multiple Purpose Floodwater Retarding and Fish and Wildlife Enhancement Structures	No.	1	94,566	12,354	106,920
Subtotal - Construction			194,918	12,354	207,272
<u>Installation Services</u>					
<u>Soil Conservation Service</u>					
Engineering Services			52,802		52,802
Other			19,353		19,353
Subtotal - Installation Services			72,155		72,155
<u>Other Costs</u>					
Land, Easements and Rights-of-way				35,462	35,462
Administration of Contracts				2,073	2,073
Subtotal - Other Costs				37,535	37,535
TOTAL STRUCTURAL MEASURES			267,073	49,889	316,962
TOTAL PROJECT			282,073	188,103	470,176
<u>Summary</u>					
Subtotal - SCS			273,373	144,603	417,976
Subtotal - FS			8,700	43,500	52,200
TOTAL PROJECT			282,073	188,103	470,176

Price Base 1961

August 1961

BENEFITS FROM WORKS OF IMPROVEMENT

The works of improvement included in this work plan will provide flood protection to ten industrial and commercial establishments employing approximately 625 people; 77 residences housing about 460 people; 3 farms; one highway bridge; and approximately one mile of streets and highways.

The works of improvement contained in this work plan will give 98.4 percent reduction in damages caused by runoff of 3.98 inches in 6 hours. This is estimated to be a 500-year frequency storm.

The "Diane" storm of August 18th 19, 1955, produced runoff greater than that to be expected from a 500-year frequency storm. The works of improvement contained in this work plan would not provide a high level of protection from a reoccurrence of the "Diane" storm.

The combined land treatment and structural program will reduce average annual damages in the watershed from \$19,156 to \$175 or 99 percent (see Table 10). The direct floodwater damages will be reduced from \$16,053 to \$151, and the indirect floodwater damages from \$3,103 to \$24.

The reduction in direct average annual floodwater damages, by type, is as follows:

Agricultural	From \$ 2,147 to \$124 (94.2%)
Retail and Commercial	From 10,999 to 22 (99.8%)
Residential	From 2,711 to 5 (99.8%)
Road, Bridge and Utility	From 195 to 0 (100.0%)

Damages in agricultural reach No. 2 (see map) caused by floods that occur more frequently than once in 20 years will be practically eliminated. The peak flows from Powdermill Brook produced by the less frequent storms will be reduced. However, the extent of reduction was not evaluated because these flood events may coincide with backwater flooding from the Westfield River. It would be difficult to differentiate the damages caused by floods from Powdermill Brook and the backwater from Westfield River. Damages caused by the Westfield River in this reach will not be reduced by the works of improvement included in this work plan.

The fish and wildlife pool in the Arm Brook site would provide a high-quality trout habitat, and support a considerably increased angling opportunity over that provided by the inundated stream segment. Some 342,500 persons live in the watershed area

and in the nearby cities of Westfield, Holyoke, West Springfield, Chicopee and Springfield and there is a great demand by fishermen from these areas for a trout fishery of the type that could be produced in the impoundment. It is estimated that about 3,000 man-days of fishing could be provided for area fishermen annually.

COMPARISON OF BENEFITS AND COSTS

The total average annual benefits of the structural works of improvement contained in this plan are \$17,582. The average annual cost of these structural measures is \$11,360. The benefit-cost ratio of the structural measures is 1.5 to 1. Benefits for fish and wildlife enhancement are not evaluated and, therefore, neither the cost nor benefits for this purpose are included in these figures.

ACCOMPLISHING THE PLAN

Land Treatment Measures

The Hampden Soil Conservation District will assist landowners and operators cooperating with the district in the preparation and application of farm conservation plans. Before construction begins on a structure, fifty percent of the land needing protection in the drainage area above will be under cooperative agreement with the Soil Conservation District.

The Agricultural Extension Service of Massachusetts will assist the Soil Conservation District in developing and carrying out an information and educational program to stimulate interest in watershed activities.

The forest land treatment measures will be installed by the landowners with technical assistance furnished by the Massachusetts Division of Forests and Parks in cooperation with the U. S. Forest Service. Individual management plans will be prepared for at least 70 forest landowners, outlining practical measures to be applied in the immediate future to maintain and improve the hydrologic condition of their forest land. Other technical assistance is needed to assure protection of watershed values and completion of the program. Included are supplemental activities such as developing timber sale or operating contracts, laying out skid trail and logging road systems, stimulation of landowner interest and participation in the program, and general planning and supervision of the program.

The Hampden County Agricultural Stabilization and Conservation Committee through the Agricultural Conservation Program will assist by offering cost-sharing on the land treatment measures and will encourage farmers in the watershed to apply those measures included in the work plan. Funds permitting, the State Agricultural Stabilization and Conservation Committee will allocate additional ACP funds to the County for carrying out cost-sharing practices to further accelerate the installation of these land treatment measures. The actual determination of how much assistance can be provided will be made on an annual basis and will be influenced by the needs and desires of the landowners.

Technical assistance will be provided by the Soil Conservation Service with funds provided by Public Law 566 and other programs. This assistance will be provided for the installation of land treatment measures for watershed protection, including assistance needed for the development of basic conservation plans on farms in the watershed.

The land treatment measures are to be installed over a five-year period.

Structural Measures

The Soil Conservation Service will provide the installation services to design, layout and supervise construction. The Service will pay construction costs allocated to flood prevention, and P. L. 566 share of the cost of construction allocated to fish and wildlife enhancement.

The City of Westfield will be responsible for administering the contracts for installation of structural measures.

The City of Westfield will obtain, at no cost to the Federal government, all land, easements and rights-of-way necessary for installation of the structural measures. The city will pay the allocated non-Federal share of construction costs for fish and wildlife enhancement. Provisions for public access to the Arm Brook site will be included in the acquisition of land, easements and rights-of-way. No special tax levy will be made for these purposes.

The Massachusetts Division of Fisheries and Game will provide material and personnel to practice fish and game management measures in the Arm Brook site.

The sponsoring local organizations do not intend to obtain a Farmers Home Administration loan.

Federal assistance for carrying out the works of improvement described in this plan will be provided under the authority of the Watershed Protection and Flood Prevention Act, Public Law 566 (83rd Congress, 68 Stat. 666) as amended.

The structural works of improvement will be installed in one year.

The schedule for installation of land treatment and structural works of improvement is as follows:

Year	Structural Measures	Land Treatment	Total
First - P. L. 566 funds	267,073	3,000	270,073
Other funds	<u>49,889</u>	<u>27,642</u>	<u>77,531</u>
Yearly Total	316,962	30,642	347,604
Second - P. L. 566 funds	--	3,000	3,000
Other funds	<u>--</u>	<u>27,643</u>	<u>27,643</u>
Yearly Total	--	30,643	30,643
Third - P. L. 566 funds	--	3,000	3,000
Other funds	<u>--</u>	<u>27,643</u>	<u>27,643</u>
Yearly Total	--	30,643	30,643
Fourth - P. L. 566 funds	--	3,000	3,000
Other funds	<u>--</u>	<u>27,643</u>	<u>27,643</u>
Yearly Total	--	30,643	30,643
Fifth - P. L. 566 funds	--	3,000	3,000
Other funds	<u>--</u>	<u>27,643</u>	<u>27,643</u>
Yearly Total	--	30,643	30,643
Project Period Totals			
P. L. 566 funds	267,073	15,000	282,073
Other funds	<u>49,889</u>	<u>138,214</u>	<u>188,103</u>
Grand Total	\$316,962	\$153,214	\$470,176

PROVISIONS FOR OPERATION AND MAINTENANCE

Land Treatment

Land treatment measures will be maintained by the landowners or operators of the lands in cooperation with the Hampden Soil Conservation District. Technical assistance and guidance will be provided by the Soil Conservation Service and by the Massachusetts Division of Forests and Parks in cooperation with the U. S. Forest Service.

Structural Measures

The City of Westfield will be responsible for operation and maintenance of the floodwater retarding structure on Powdermill Brook and the multiple purpose floodwater retarding-fish and wildlife enhancement structure on Arm Brook. Necessary funds will be provided through appropriations by the city.

An operation and maintenance agreement will be executed between the City of Westfield and the Federal government prior to issuing the invitations to bid for the construction of the structures.

Inspections of the structural works of improvement will be made annually and after major storms as provided for in the operation and maintenance agreement. The Soil Conservation Service will provide at least one technical representative to accompany those making these inspections.

The annual cost of operating and maintaining the two structures is estimated to be \$1,200 and will consist of but not be limited to, the following:

1. Remove and burn debris.
2. Refill, smooth and vegetate rilling on embankments, spillways and drainage ways.
3. Realign disposal channel.
4. Repair damaged riprap or other works.
5. Repair fences and gates.
6. Maintain a good sod cover.

The City of Westfield will keep records of maintenance work performed and costs thereof, and report them annually to the Soil Conservation Service.

COST SHARING

The total project cost is estimated to be \$470,176. Forty percent or \$188,103 will be borne by other than Public Law 566 funds. The remaining 60 percent or \$282,073, will be provided from Public Law 566 funds.

The following costs will be paid by other than Public Law 566 funds:

1. The cost of applying land treatment measures on non-Federal land amounting to \$138,214. Of this amount \$94,714 is for cropland and pasture practices, and \$43,500 is for forestry practices.

The cost of applying land treatment measures estimated to be \$89,774 for cropland and pasture practices and \$33,960 for forestry practices will be borne by local landowners and operators.

State funds will provide \$8,700 for technical assistance on forestry practices, and tree planting stock with an estimated value of \$840.

Other state and Federal programs will provide technical assistance for cropland and pasture practices at an estimated cost of \$4,940.

It is expected that landowners and operators will utilize cost-sharing assistance made available under the Agricultural Conservation Program through the Hampden County Agricultural Stabilization and Conservation Committee. The Clarke-McNary Act and the Cooperative Forest Management Act will make substantial contributions to the program during the five-year installation period. It is further expected that such cost-sharing assistance as will be available under other Federal and State programs will be utilized.

2. The cost of providing land, easements and rights-of-way estimated to be \$35,462. This includes \$3,459 allocated to fish and wildlife enhancement in the Arm Brook site.
3. The cost of administering contracts estimated to be \$2,073. This includes \$210 allocated to fish and wildlife enhancement in the Arm Brook site.

4. The non-Federal portion of construction costs allocated to fish and wildlife enhancement in the Arm Brook site, estimated to be \$12,354.
5. The annual cost of operating and maintaining the structural works of improvement, estimated to be \$1,200. This includes \$137 allocated to fish and wildlife enhancement in the Arm Brook site.

The following costs will be paid by the Federal government from Public Law 566 funds:

1. The cost of providing the technical assistance needed to accelerate the land treatment measures on non-Federal land, estimated to be \$15,000. Of this amount \$6,300 will be used by the Soil Conservation Service and \$8,700 by the U. S. Forest Service.
2. The cost of installation services associated with the structural works of improvement, estimated to be \$72,155. This includes \$7,377 allocated to fish and wildlife enhancement in the Arm Brook site.
3. The construction cost of structural measures, estimated to be \$194,918. This includes \$8,645 allocated to fish and wildlife enhancement in the Arm Brook site.

CONFORMANCE OF PLAN TO FEDERAL LAWS AND REGULATIONS

The Powdermill Brook Watershed is a tributary of the Westfield River. The project contained herein is a logical step in the comprehensive development of the Westfield River, which is a tributary of the Connecticut River.

This work plan conforms to all applicable State and Federal laws, including provisions of the Soil Bank Act, Public Law 540, 84th Congress, as amended.

SECTION 2

INVESTIGATIONS, ANALYSES, SUPPORTING TABLES AND MAPS

LAND TREATMENT MEASURES

Total land treatment needs have been estimated by work unit personnel by studying aerial photographs of the watershed and by ocular observation of most of the land currently in farm crop production. The total program planned for installation over the five-year period was based on estimates of what the cooperators would accomplish if adequate technical assistance were available giving due consideration to the added stimulus from the watershed project. The acreage, number of cooperators and number of basic plans in the watershed area were prorated against the totals for the Soil Conservation Districts to determine the level of the going program in the watershed.

The difference between the planned program and the going program determined the accelerated program which is included in this work plan. Technical assistance needed for the accelerated program was determined by using current work unit rates for planning and application activities.

HYDRAULICS AND HYDROLOGY

General

Procedures and criteria used in the development of the hydrologic and hydraulic phases of the work plan are outlined in National Engineering Handbook, Section 4, Hydrology, Supplement A and other Soil Conservation Service technical guides and memorandums.

The "Diane" flood of August 19, 1955, was used as a basis in the damage analysis of the watershed. The discharges and damages in the watershed were increased considerably in this storm by the failure of two railroad embankments across the valley directly upstream of the damage area. This failure was caused primarily by the limited capacity of the culverts through the embankments. These two culverts have both been replaced with larger pipes which subsequent studies show to be adequate. The effect of this change was recognized in the evaluation of flood flows and damages.

Frequency Data

Rainfall versus frequency relationships were derived from U. S. Weather Bureau, Technical Paper No. 29. Soil-cover complex numbers were computed from information furnished by the Soil Conservation Service and the U.S.D.A. Forest Service. Runoff data was obtained using the above information and E&WP Unit Engineering Memorandum No. 36, Hydrology No. 4.

A monthly distribution of flood probability was developed from stream flow records in the area for agricultural damage appraisals.

Evaluation Routing

The runoff from the two year, twenty year, and one hundred year storms were stream routed to the damage areas. The watershed above the damage area was divided into nine sub-watersheds. Synthetic hydrographs were developed for each sub-watershed for the three storms. These hydrographs were stream routed through successive sub-watersheds using Wilson's method as outlined in NEH-4A. The peak discharges at the damage point were plotted to obtain a discharge frequency curve which was used in the economic evaluation of the watershed.

The effect of land treatment measures was computed using the change in complex curve number by the procedure described in E&WP Unit Memorandum No. 34, Hydrology No. 3.

The same three storms of the evaluation series were routed to determine the peak flows with the proposed project. The hydrographs were graphically flood routed through the two retarding structures by Method No. 2, NEH-5, Hydraulics. The outflow from the structures were then stream routed to the damage area by Wilson's Method. The future discharge versus frequency curve was developed using the peak flows from these three storms.

Key Storm Routings

The storm of August 18 and 19, 1955, was reproduced from local rainfall records. The recorded rainfall for this storm was 19.76 inches in 34 hours. The sub-watershed hydrographs were developed using one hour increments. These hydrographs were stream routed to the damage reaches by Wilson's Method. The storm peak discharges were checked at the new railroad culverts to determine if the embankments would be endangered. Study revealed that the capacity of the culverts is sufficient to protect the embankments for a reoccurrence of this storm. This study was based upon stream hydraulics with no excessive debris problem or other unforeseeable adverse conditions. The structures proposed in this plan would give added protection to the embankments.

The "Diane" storm was also routed under future conditions to determine the safety of the proposed structures. The storm was graphically flood routed through the sites. These routings proved that a reoccurrence of the "Diane" storm would not endanger the structures.

Rating Curves

Water surface profiles were used to develop rating curves for the damage reaches. A one-foot contour topographic map was made of the floodplain from Sandy Hill Road to North Elm Street. Cross-sections were taken from this map. Additional cross-sections were surveyed as needed above North Elm Street. Water surface profiles were computed for four discharges from Sandy Hill Road upstream to the upper railroad culvert, using the Step Method as outlined in NEH-4A. The backwater effect of the Westfield River on these profiles was considered. Rating curves were developed from these profiles.

Evaluation

An evaluation series of stage versus percent chance was prepared for each reach. The evaluation series was taken to a 500 year frequency for the residential and commercial damages. The area inundated by storms up to a 20 year frequency were plotted on the topographic map for the agricultural damage evaluation. Storms of less frequent occurrence may coincide with backwater from the Westfield River. Therefore, no evaluation was made for storms of greater magnitude. Agricultural benefits would be derived from larger storms which do not coincide with backwater from the Westfield River. These benefits have not been evaluated.

Structures

The 100 year floodwater detention requirements for the two floodwater retarding structures were determined by the procedure in Technical Release No. 10. The maximum volume of storage required was based on a 55 hour and a 70 hour storm for the Arm Brook site and Powdermill Brook site respectively. These requirements were greater than those determined by routing the 6 hour, 100 year rainfall hydrograph through the sites using antecedent moisture condition III. Hydrographs for emergency spillway and freeboard design were developed following the recommended criteria in E&WP Unit Memorandum No. 47, Hydrology No. 7.

ECONOMICS

Damage Appraisals

A complete damage survey was conducted within the flood plain of the Powdermill Watershed. Ninety-eight appraisals, keyed to the flood stage of hurricane "Diane", August 19, 1955, were collected. Damage estimates were made by one-foot increments below the stage of the key storm to the elevation where there was no remaining property damage. Damages were estimated at a 1961 price base and converted to long-term price projections.

Some sediment damage occurs to agricultural land within the watershed. This was included in the floodwater damage appraisal and not considered separately.

The indirect damages were estimated to be 20% of the direct damages for residential and commercial and 15% for agricultural in accord with Chapter 3, Economics Guide.

Evaluation

Average annual damages and benefits were computed using the frequency method described in Chapter 3 of the Economics Guide.

The floodwater retarding structure and the floodwater retarding-fish and wildlife enhancement structure were evaluated as one unit because of their interdependence to a common damage center.

Residential, commercial and utility damages were tabulated for each hydraulic reach. They were evaluated up to a 500 year storm.

Agricultural damages are confined within Reach 2 and were evaluated separately. Present cropping pattern, yield levels and cultural practices were obtained from local farmers, Soil Conservation Service technicians, State and Federal market service and extension service. Damage rates were established by fifteen-day intervals for the growing season. Monetary values were computed in accordance with Economic Guide.

Agricultural damages were evaluated only up to the 20 year storm due to the possible effect of backwater from the Westfield River.

Cost Allocation

The Arm Brook structure will be multiple purpose for flood prevention and fish and wildlife enhancement. Allocation of costs by purposes were computed by the use-of-facilities method. The structure provides for 8 acre-feet for sediment storage, 142 acre-feet for fish and wildlife purposes, and 581 acre-feet for floodwater storage. The sediment storage was prorated to flood prevention and fish and wildlife enhancement in proportion to the storage provided for each of these purposes.

Computation of Total Cost Allocation			
	Flood Preven- tion	Fish and Wildlife Enhance- ment	Total
1. Capacity, including allocated sediment	587.43	143.57	731
2. Percentages to be used for joint costs	80.36	19.64	100
3. Total allocated costs*	\$131,118	\$32,045	\$163,163

*There were no specific costs for this structure.

The cost of each installation item is allocated to each purpose using the same percentages as were used to allocate the total cost, as follows:

Computation of Allocation of Cost of Installation Items by Purpose			
Installation Item	Flood Preven- tion (80.36%)	Fish and Wildlife Enhance- ment (19.64%)	Total
1. Construction	85,921	20,999	106,920
2. Installation Services	30,185	7,377	37,562
3. Administering Contracts	859	210	1,069
4. Land, easements & rights-of-way	14,153	3,459	17,612
Totals	131,118	32,045	163,163

Of the \$32,045 allocated to fish and wildlife enhancement, \$16,022 will be provided from Public Law 566 funds and \$16,023 from other funds.

Computation of Cost Sharing						
Installation Item	P. L. 566 Funds			Other Funds		
	Flood Prevention	Fish & Wildlife Enhancement	Total	Flood Prevention	Fish & Wildlife Enhancement	Total
1. Construction	85,921	8,645	94,566	-	12,354	12,354
2. Installation Services	30,185	7,377	37,562	-	-	-
3. Administering Contracts	-	-	-	859	210	1,069
4. Land, easements & rights-of-way	-	-	-	14,153	3,459	17,612
Totals	116,106	16,022	132,128	15,012	16,023	31,035

Land, Easements and Rights-of-way

The local organization estimated the cost at \$238 per acre. This is an average cost per acre for all property needed to install structural measures. It also includes estimated cost of fees and services.

GEOLOGY

Structure Site Investigation

A preliminary examination of the proposed sites reveals many similar characteristics. Both sites are located in an area of intense glaciation. The unconsolidated material consists of till and stratified deposits of glacio-lacustrine origin. The till ranges from clays and silts to large boulders several feet in thickness. Valley bottoms range from a mantle of compressible alluvial silts and clays to sands and gravels. It is possible that the compressibility of materials may require intense investigation.

Arm Brook site is planned to be a multiple-purpose structure. Preliminary geologic investigation revealed an impermeable layer of silts which would prevent excessive leakage.

Sediment and Erosion Studies

Sediment damage in the watershed is negligible being confined to infertile overwash and some scouring. These sediment damages were not of sufficient extent to warrant a detailed survey and are included as floodwater damages.

The Probable Soil Loss Formula was used in computing the sediment storage requirement for each structure. Trap efficiency was obtained from the trap efficiency curve ESNE-29 using the medium curve.

STRUCTURE INVESTIGATION

Floodwater Retarding and Multiple Purpose Structures

The engineering, hydrologic, geologic, and economic studies made of this watershed led to the selection of the two structures described in this plan as the best solution to the flood problems.

The structures were proportioned in accordance with Soil Conservation Service criteria defined in SCS Engineering Memorandum 27 (Revised) and as recommended in E&WP Engineering Memorandum #47, Hydrology #7. The procedures used are described in National Engineering Handbook, Section 5 and Technical Release #2.

Principal Spillways

The reinforced concrete pipe principal spillways were proportioned to produce outflows consistent with available storage and the downstream channel capacity. Both sites have one-stage, reinforced concrete risers. The riser crest for the Powdermill site is set at an elevation which will provide for an estimated 50-year sediment accumulation. An opening of the bottom of the riser will provide for passing normal flow. The crest of the Arm Brook riser is at an elevation which will provide for storage desired for fish and wildlife enhancement in addition to 50-year sediment accumulation.

Emergency Spillways

The emergency spillways will have a short length of level section, an entrance channel on an adverse grade, and an exit channel on a steep slope. The exit channels are straight until they are beyond the downstream toe of the dam.

The emergency spillways were proportioned by the procedure outlined in Technical Release #2. The proportions were then checked by a graphical flood routing. The stage discharge curve was prepared from water-surface profiles for various discharges.

Field Surveys

Transit and plane table were used in making topographic surveys of the two structure sites, and in running centerline profiles of the two dams. The topographic surveys were used to develop stage-storage and stage-area curves for the structural layouts. Profiles of the centerline of the dams were used in estimating earth fill quantities.

TABLE 2 - ESTIMATED STRUCTURE COST DISTRIBUTION
Powdermill Brook Watershed
Massachusetts

Structure Site Name	Installation Costs - PL 566 Funds				Installation Costs - Other Funds					Total Instal- lation Cost
	Construction		Instal. Services		Engineers Estimate	Contin- gencies	Adm. of Contract	Easements & R. of W. Funds	Total Other	
	Engin- eering	Other Funds								
Arm Brook	78,805	15,761	27,579	9,983	10,295	2,059	1,069	17,612	31,035	163,163
Powdermill Brook	89,600	10,752	25,223	9,370			1,004	17,850	18,854	153,799
GRAND TOTAL	168,405	26,513	52,802	19,353	10,295	2,059	2,073	35,462	49,889	316,962

Price Base 1961

August 1961

TABLE 3 - STRUCTURE DATA
Floodwater Retarding Structures
Powdermill Brook Watershed - Massachusetts

ITEM	UNIT	ARM	POWDERMILL	TOTAL
Drainage Area	Sq. Mi.	3.4	4.6	8.0
<u>Storage Capacity</u>				
Sediment	Ac. Ft.	8	15	23
Fish and Wildlife	Ac. Ft.	142	---	142
Floodwater Detention	Ac. Ft.	581	966	1,547
Total	Ac. Ft.	731	981	1,712
<u>Surface Area</u>				
Sediment Pool	Ac.	2	5	7
Fish and Wildlife Pool	Ac.	13	---	13
Flood Detention Pool	Ac.	56	56	112
Volume of Fill	Cu. Yds.	77,200	100,000	177,200
Elevation Top of Dam	Ft.	218.5	202.5	---
Maximum Height of Dam	Ft.	256	47	---
<u>Emergency Spillway</u>				
Crest Elevation	Ft.	213.5	197.0	---
Bottom Width	Ft.	184	260	---
Type	-	Earth	Earth	---
Percent Chance of Use	-	1.0	1.0	---
Aver. Curve No.-Con'd II	-	68	68	---
<u>Emergency Spillway Hydrograph</u>				
Storm rainfall (6 hr.)	In.	15.2	15.0	---
Storm runoff	In.	10.7	10.5	---
Velocity of Flow (v_c) <u>1/</u>	Ft./sec.	8.0	8.0	---
Discharge rate <u>1/</u>	c.f.s.	3,060	4,200	---
Max. w.s. elev. <u>1/</u>	Ft.	217.0	200.5	---
<u>Freeboard Hydrograph</u>				
Storm rainfall (6 hr.)	In.	21.7	21.4	---
Storm runoff	In.	16.9	16.6	---
Velocity of Flow (v_c) <u>1/</u>	Ft./sec.	9.0	9.5	---
Discharge rate <u>1/</u>	c.f.s.	5,540	7,900	---
Max. w.s. elev. <u>1/</u>	Ft.	218.5	202.3	---
<u>Principal Spillway</u>				
Capacity at E.S. Crest	c.f.s.	271	330	---
<u>Capacity Equivalents</u>				
Sediment volume	In.	0.04	0.06	---
Detention volume	In.	3.3	4.0	---
Spillway storage	In.	1.1	0.8	---
Class of Structure	-	c	c	---

1/ - Maximum during passage of hydrograph.

TABLE 4 - SUMMARY OF PHYSICAL DATA
Powdermill Brook Watershed
Massachusetts

Item	Unit	Future Without Project	Future With Project
Watershed Area	Sq. Mi.	20.0	---
Watershed Area	Acre	12,825	---
Area Privately Owned	Acre	12,055	11,906
Area Non-Federal Public	Acre	770	919
Area of Cropland	Acre	1,339	1,339
Area of Woodland	Acre	7,725	7,712
Area of Grassland	Acre	1,025	1,025
Area of Farmstead & Urban	Acre	1,885	1,885
Area in Ponds, Streams, Lakes, etc.	Acre	260	273
Area of Brush & Idle	Acre	591	591
Average Annual Rainfall	Inches	47	---

August 1961

TABLE 5 - SUMMARY OF PLAN DATA
Powdermill Brook Watershed
Massachusetts

ITEM	UNIT	QUANTITY
Years to Complete Project	Year	5
Total Installation Cost		
Public Law 566 Funds	Dollar	282,073
Other Funds	Dollar	188,103
Annual O & M Cost		
Non-Federal	Dollar	1,200
Average Annual Monetary Benefits <u>1/</u>	Dollar	17,582
Agricultural	Percent	10.6
Non-Agricultural	Percent	89.4
Structural Measures		
Floodwater Retarding Structures	Each	1
Multiple Purpose Structures	Each	1
Area Inundated by Retarding Structures		
Sediment Pool	Acre	7
Fish and Wildlife Pool	Acre	13
Detention Pool	Acre	112
Watershed Above Retarding Structures	Acre	5,076
Reduction of Floodwater Damage	Dollar	18,981
By Land Treatment Measures for		
Watershed Protection	Dollar	1,399
By Structural Measures	Dollar	17,582

1/ From Structural Measures

Price Base 1961

August 1961

TABLE 6 - ANNUAL COSTS
Powdermill Brook Watershed
Massachusetts

Measures	Amortization of Installation Costs	O & M Costs Non-Federal	Other Economic Costs	Total
Evaluation Unit No. 1 Floodwater Retarding Structure: Powdermill Brook	5,558	500		6,058
Multiple Purpose Floodwater Retarding and Fish and Wildlife Enhancement Structure: Arm Brook	4,739	563		5,302*
TOTAL	10,297	1,063**		11,360

Amortized at 2 5/8% for 50 years.

* Does not include \$1,158 amortized installation costs and \$137 annual operation and maintenance for fish and wildlife enhancement.

** O and M long term price level as projected by Agricultural Research Service, Price Projection, September 1957.

August 1961

TABLE 7 - MONETARY BENEFITS FROM STRUCTURAL MEASURES
Powdermill Brook Watershed
Massachusetts

Item	Dollars 1/			Average Annual Monetary Benefits
	Estimated Average Annual			
	Damages			
	Without Project	After Land Treatment For W/S Protection	With Project	
Floodwater Damages				
Agricultural 2/	2,148	1,984	124	1,860
Retail & Commercial	10,999	10,201	22	10,179
Residential	2,711	2,515	5	2,510
Bridge, Road, etc.	195	180	0	180
Subtotal	16,053	14,880	151	14,729
Indirect Damages	3,103	2,877	24	2,853
Total All Damages	19,156	17,757	175	17,582

1/ Price base long term price level as projected by Agricultural Research Service, Price Projection, September 1957.

2/ Damages were not evaluated for flood events less frequent than the 20-year flood (see page 14).

August 1961

TABLE 3 - BENEFIT-COST ANALYSIS
Powdermill Brook Watershed
Massachusetts

Measures	Average Annual Benefits				Average Annual Cost	Benefit Cost Ratio
	Flood Prevention		Non-Agr. Water Mgmt.			
	Floodwater	Indirect	Changed Land Use	Fish & Wildlife Enhancement	Total	
<u>EVALUATION UNIT NO. 1</u>						
1 Floodwater Retarding Structure:						
Powdermill Brook						
1 Multiple Purpose Floodwater Retarding and Fish & Wildlife Enhancement Structure:						
Arm Brook	14,729	2,853	---	---	17,582	1.5 to 1
Total	14,729	2,853	---	---	17,582	
GRAND TOTAL						

* Benefits for fish and wildlife are not evaluated and, therefore, neither the cost nor benefits for this purpose appear in the benefit cost ratio.

Price base long term price level as projected by Agricultural Research Service, Price Projection, September 1957.

August 1961

TABLE 9
 ALLOCATION OF INSTALLATION COSTS OF STRUCTURAL MEASURES
 Powdermill Brook Watershed
 Massachusetts
 (Dollars)

Item	Purpose		Total
	Flood Preven- tion	Fish & Wildlife Enhance- ment	
STEP A			
One Floodwater Retarding Structure (Powdermill)	153,799	---	153,799
One Multiple Purpose Flood- water Retarding and Fish & Wildlife Enhancement Structure (Arm)	131,118	32,045	163,163
TOTAL	284,917	32,045	316,962
STEP B			
P. L. 566	251,051	16,022	267,073
Other	33,866	16,023	49,889
TOTAL	284,917	32,045	316,962

Price Base 1961

August 1961

TABLE 10 - BENEFITS FROM WORKS OF IMPROVEMENT BY REACHES
Powdermill Brook Watershed
Massachusetts

Damage Reach	Drainage Area Above Reach	Discharge At Which Damage Begins	Present Conditions			Future Conditions		
			Peak Flow 100-Year Flood	Peak Flow 100-Year Flood	Average Annual Damages	Peak Flow 100-Year Flood	Average Annual Damages	Average Annual Damages
		c.f.s.	c.f.s.	Dollars	Dollars	c.f.s.	Dollars	Dollars
1	5,700	1,850	2,365	116,500	3,707	780	0	0
2	6,400	550	2,400	96,490	15,449	800	1,148*	175

* Agricultural

August 1961

Westfield City Water Dams



o Westfield

- Westfield Water Department Dams as follows:
Montgomery Reservoir Dam - Montgomery
Tekoa Reservoir Dam - Montgomery
Granville Dam - Granville
Winchell Reservoir Dam - Granville
Japhet Reservoir Dam - Granville
Fire Protection Dams -Arnold, Wells Mills & Strong Dams

Also See Dam Report Section: Westfield

Dam	Fire Protection Dams -(Arnold, Wells Mills & Strong Dams)
Dam	Tekoa Reservoir Dam
Dam	Montgomery Reservoir Dam
Dam	Granville Dam
Dam	Winchell Reservoir Dam
Dam	Japhet Reservoir Dam

CONTRACT FOR REPAIRS TO WATER SUPPLY SYSTEM
CITY OF WESTFIELD, MASS.

WHITMAN & HOWARD, INC.
ENGINEERS
89 Broad Street
Boston, Mass.

*See Page 10 for
County Commissioners'
approval.*

MAY, 1956

CONTRACT FOR REPAIRS TO WATER SUPPLY SYSTEM
CITY OF WESTFIELD, MASS.

WHITMAN & HOWARD, INC.
ENGINEERS
89 Broad Street
Boston, Mass.

MAY, 1956

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CITY OF WESTFIELD, MASS.

Invites Proposals

For repairs to water supply system, including repairing and replacing dams, channels, bridges and roadways; excavating reservoirs, etc., in Hampden County, Mass., for the City of Westfield, Mass. A bond of not less than the amount of the contract, with satisfactory surety, for faithfully doing the work, will be required.

The office copy of the contract for the work can be seen and the proposal to be used can be obtained from the Board of Public Works, Westfield, Mass., and at the office of Whitman & Howard, Inc., Engineers, 89 Broad Street, Boston, upon the deposit payment of \$10.00. Said deposit will be refunded if such documents are returned in good condition at or before the time for opening bids.

The proposal must be filled out and signed as directed therein, sealed in an envelope addressed to the Board of Public Works of the City of Westfield, Mass., endorsed with the name and address of the bidder and "Proposal for Repairs to Water Supply System", and submitted with a certified check for \$8,000.00, payable to the City of Westfield, at the Water Department Office, City Hall, Westfield, Mass., on or before 7:30 o'clock p.m., Eastern Daylight Saving Time, Thursday, May 31, 1956; this check to be the property of the said City if the bidder fails to execute the contract and satisfactory bond within seven days after the contract may have been awarded to him.

Attention is called to the fact that minimum wage rates are established for the project as set forth in the contract documents.

Proposals filled out and left with check, as above directed, and no other will at the above-named hour and place be publicly opened and read, and the undersigned reserve the right to reject any or all proposals, or to accept the proposal they deem best for the City.

The bidder shall start the work under this contract within seven calendar days after its acceptance by the Board of Public Works.

No proposal may be withdrawn within thirty days of the opening of bids.

CITY OF WESTFIELD, MASS.

By its Board of Public Works

Ralph E. Sanville, Chairman
Gerald Fitzgerald
Edward M. Eggleston

PROPOSAL

FOR REPAIRS TO WATER SUPPLY SYSTEM for the City of Westfield, Mass.
TO: Board of Public Works, City of Westfield, Mass.

The undersigned declares that no person in the employ of the said City is pecuniarily interested in this proposal or in the contract for the work which he proposes to do; that he has carefully examined the office copy of the contract and specifications and has informed himself fully in regard to all conditions pertaining to the site or sites where the work is to be done, and carefully estimated on the work. He understands that the City, its agents and employees are not to be in any manner held responsible for the accuracy of, or bound by, any estimates or plans, or underground structures relating to the work, and that if any have been given or made, they are to be considered solely as a base for filling out and comparing the several proposals.

The undersigned proposes to furnish all the labor and equipment required for repairing and replacing dams, channels, bridges, and roadways; excavating reservoirs, etc., in Hampden County, Mass., for the Board of Public Works, City of Westfield, Mass., in accordance with the accompanying specifications and plans prepared by Whitman & Howard, Inc., Engineers, 89 Broad Street, Boston, Mass., for the sums specified below, subject to additions and deductions or deletions, according to the specifications and in all respects according to the terms thereof.

The undersigned proposes and agrees that within seven days next after the day on which notice of the acceptance of this

proposal shall be given to him or mailed to him at the address hereinafter given, he will sign in quadruplicate in the form of the office copy thereof, a contract for doing the work described in said copy; and will execute and deliver to said Board of Public Works for said City, a bond in the sum specified in said copy and accompanied with properly executed Default Agreement in the attached form, conditioned to faithfully furnish and do everything required of the contractor in said copy, with a surety company authorized to do business in the Commonwealth of Massachusetts satisfactory to said Board of Public Works as Surety, the undersigned to receive and the City to allow as payment for the work, including everything furnished or done by, or resulting to, the Contractor in doing the work, the sums stated in the several items as follows.

It is understood that the quantities given in this proposal are approximate only and are given as a basis for comparison of the proposals. The City does not expressly or by implication agree that the actual amount of work will even approximately correspond herewith but reserves the right to increase or decrease or delete the amount of any item of the work listed as may be found desirable or necessary during the carrying out of this construction work and the unit prices for increasing or decreasing the amount in the items quoted in the proposal shall apply without change to such variation in the quantity of each of the items.

This proposal may be accepted by the Board of Public Works at any time within thirty days of the opening of bids.

(Fill out prices with ink in writing and in figures; in case of discrepancy between prices in writing and in figures, the writing shall govern. In case of discrepancy between total of items and total of bid amount stated, total of items shall govern.)

Bidders must quote on all items.

- Item 1. For furnishing and placing fill at Granville Reservoir, including all necessary grading, rolling, compacting and other incidental items of work required for the formation of embankments, roadways and other graded areas, the lump sum of _____ Dollars (\$ _____).
- Item 2. For excavating the existing by-pass channel and adjacent areas at Granville Reservoir, including repairs to existing concrete and masonry by-pass channel, and other incidental items of work, the lump sum of _____ Dollars (\$ _____).
- Item 3. For furnishing and installing concrete at Granville Reservoir to restore damaged walls and slab of spillway channel to original lines and grade, including all under-drains, form work, finishing, etc., the lump sum of _____ Dollars (\$ _____).
- Item 4. For furnishing and placing loaming and seeding at Granville Reservoir, including all loaming, seeding, rolling, etc., the lump sum of _____ Dollars (\$ _____).
- Item 5. For furnishing and placing fill at Winchell Reservoir, including all necessary grading, rolling, compacting, and other incidental items of work required for the formation of embankments, and other graded areas, the lump sum of _____ Dollars (\$ _____).
- Item 6. For furnishing and placing all materials at Winchell Reservoir required to restore the spillway channel to original lines and grade including all fill, excavation, rip-rap, etc., the lump sum of _____ Dollars (\$ _____).

- Item 7. For furnishing and installing loaming and seeding at Winchell Reservoir, including all loaming, seeding, rolling, etc., the lump sum of _____ Dollars (\$ _____).
- Item 8. For excavating and disposing of about 6,200 cubic yards of reservoir excavation at Winchell Reservoir, the sum of _____ Dollars (\$ _____), per cubic yard.
- Item 9. For furnishing and placing fill at Japhet Reservoir, along with loaming and seeding, including all necessary grading, rolling, compacting, etc., all in the area adjacent to the masonry dam, the lump sum of _____ Dollars (\$ _____).
- Item 10. For excavating and disposing of about 600 cubic yards of reservoir excavation at Japhet Reservoir, the sum of _____ Dollars (\$ _____), per cubic yard.
- Item 11. For incidental items of work at Montgomery Reservoir, including filling washout atop dam, and along masonry wall atop dam, and loaming and seeding washed out areas along downstream face of dam, the lump sum of _____ Dollars (\$ _____).
- Item 12. For furnishing and placing all materials at Bridge No. 2 required to restore to original lines and grade, including all fill, excavation, rolling, compacting, repair of masonry abutments, and other incidental items of work, the lump sum of _____ Dollars (\$ _____).
- Item 13. For furnishing and installing all material at Bridge No. 1 required to restore to original lines and grade, including all fill, excavation, rolling, compacting, construction of abutments and timber bridge, and other incidental items of work, the lump sum of _____ Dollars (\$ _____).

- Item 14. For furnishing and installing all materials at Tekoa Bridge required to construct concrete abutments and timber bridge, and other incidental items of work, the lump sum of

_____ Dollars (\$ _____).

- Item 15. For furnishing and placing fill at Tekoa Reservoir, including all necessary grading, rolling, compacting, and other incidental items of work required for the formation of embankments, roadways, and other graded areas, the lump

sum of

_____ Dollars (\$ _____).

- Item 16. For excavating spillway channel at Tekoa Reservoir, including removal of trees and disposal of all materials and other incidental items of work, the lump sum of _____

_____ Dollars (\$ _____).

- Item 17. For furnishing and placing loaming and seeding at Tekoa Reservoir, including all loaming, seeding, rolling, etc., the lump sum of _____

_____ Dollars (\$ _____).

- Item 18. For excavating and disposing of about 8,500 cubic yards of reservoir excavation at Tekoa Reservoir, the sum of

_____ Dollars (\$ _____), per cubic yard.

- Item 19. For incidental items of work at Tekoa Reservoir including construction of diversion dam; removing superstructure; placing concrete roof slab and removal of sand, gravel and debris at the existing valve chamber; and repairing chain link fence atop the dam, the lump sum of _____

_____ Dollars (\$ _____).

- Item 20. For regrading, filling and shaping existing roadways shown on plans, and other incidental items of work in connection therewith, the lump sum of _____

_____ Dollars (\$ _____).

Item 21. For work at Humburt Gutter, including excavating channel, filling over water main and repairing masonry culvert, the lump sum of _____

_____ Dollars (\$ _____).

Item 22. For about 300 cubic yards of ledge and boulder excavation at Granville, Winchell, Japhet, Montgomery and Tekoa Reservoirs, at bridge sites, and at Humburt Gutter, the sum of _____

_____ Dollars (\$ _____), per cubic yard.

Item 23. For furnishing and installing all materials at Chapin Pond necessary for the construction of the earth dam, roadway, manhole, piping, rip-rap, etc., including all grading, rolling, compacting and incidental items of work, the lump sum of _____

_____ Dollars (\$ _____).

Item 24. For extra work and materials furnished under order in writing by the Engineers, on their usual stationery, the City will allow such increased compensation as referred to in Article 14.

Total amount of Proposal based on Engineer's estimate of quantities:

_____ Dollars (\$ _____).

The undersigned further agrees that the certified check left by him with said Board of Public Works, payable to the City of Westfield, Mass., shall be the property of said City if he shall fail to carry out said proposal, otherwise the check is to be delivered up to him on his receipt therefor. The amount of said check is agreed upon by the undersigned and said City to be the damages which said City will sustain by such failure.

(Bidder) _____

By _____

(Title) _____

This proposal must bear the written signature of the bidder or an authorized agent of the bidder. If the bidder is a corporation or a partnership the bid must be signed by a duly authorized officer of such corporation or by a partner and the title of such officer must be stated. If the bidder is a corporation the corporation seal must be impressed on this page.

(Address) _____

(Date) _____

CONTRACT FOR REPAIRS TO WATER SUPPLY SYSTEM in Hampden County, Mass.
for the City of Westfield, Mass.

The City of Westfield, a municipal corporation located in the Commonwealth of Massachusetts, by its Board of Public Works, duly authorized and without personal liability for the individual members thereof, and

hereinafter designated as the Contractor, agree as follows:

ARTICLE 1. The Contractor shall do all the work and furnish all the materials, except as herein otherwise specified, necessary or proper for performing and completing the work hereinafter specified.

ARTICLE 2. Whenever the word "City" is used in this agreement it shall be understood to mean the City of Westfield, Mass., acting through its Board of Public Works. The word "Board" shall mean the Board of Public Works of the City of Westfield, Mass.. The word "Engineer" or "Engineers" or pronouns in place of them shall be deemed to refer to Whitman & Howard, Inc., Engineers, acting for the said Board of Public Works of the City of Westfield, either directly or through their properly authorized assistants or agents, such assistants or agents acting severally within the scope of the particular duties entrusted to them.

ARTICLE 3. All the work under this agreement or contract shall be done to the satisfaction of the Engineers, who shall in all cases determine the amount, quality, acceptability and fitness of the several kinds of work and materials which are to be paid for hereunder and shall decide all questions which may arise as to the fulfillment of this contract on the part of the Contractor and their determination and decision thereon shall be final and conclusive; and such determination and decision, in case any question shall arise, shall be a condition precedent to the right of the Contractor to receive any money hereunder.

The plans and specifications, proposal and addenda shall form part of this contract.

HAMPDEN COUNTY
APPROVED

ARTICLE 4. SPECIFICATIONS OF THE WORK SEP 12 1956

Section 1. WORK TO BE DONE

- Locus. (a) The work to be done is to furnish and install all necessary materials for repairing and replacing ~~reservoirs~~ dams, channels, bridges and roadways; excavating reservoirs; filling; loaming and seeding; grading, etc., together with all appurtenances, in Hampden County, in private lands, public streets, private ways, etc., conforming so far as they go to plans of the proposed work entitled:
- Plans. "Repairs to Water Supply System, Westfield, Mass.", dated May, 1956, Sheet 1 of 13 to Sheet 13 of 13, inclusive,
- all made by Whitman & Howard, Inc., Engineers, 89 Broad Street, Boston, on file with the Board of Public Works, and any changes, drawings, plans and directions that may from time to time be furnished by the Engineers.
- Changes and Connections. (b) Make changes in existing or new structures to meet the requirements of the work and connections therefor and add new construction for these purposes where necessary.
- Extra Work. (c) Furnish all extra work and materials that may be ordered in writing by the Engineers on their usual stationery.
- Care of Watercourses, Sewers, Drains, etc. (d) Maintain the flow in all watercourses, water pipes, sewers, drains and pipes interfered with by the Contractor, or convey the flow in covered channels to a suitable point of discharge in such a manner as not to flow upon or hinder the other work or cause any nuisance.
- Restoration of Services, etc. (e) Care for, replace and restore to good condition, satisfactory to the Engineers any public or private way, sewer, drain, water, gas, or other pipe, catch basin, wire, cable, building, fence, post, pole, mail box or other structure interfered with by the Contractor. Protect existing water pipes and other utilities and repair or replace all pipes or conduits damaged by the Contractor.
- Order of Doing Work and Notification. (f) The Contractor shall notify the Water Department of the City of Westfield in writing at least two days before he begins work under this Contract.
- The Contractor shall start actual construction work under this Contract at such locations as the Engineers may direct.

Time for (g) The Contractor shall complete the above work within
Completion. 125 consecutive calendar days from and including the
date of Contract.

Section 2. GENERAL DIRECTIONS

- Dimensions. (a) Figure dimensions in preference to scale dimensions
are to be followed in all plans and drawings.
- Lines and (b) The Engineers will furnish information pertaining to
Grades. surveys and bench marks sufficient for controlling
the layout of the work. The Contractor shall employ,
at his own expense, a competent civil engineer who
shall stake out the lines and grades for the work;
establish levels, including a permanent bench, and
erect batter boards at such locations that they will
not be disturbed during the construction of the work.
All reference marks shall be verified by an instrument
at frequent intervals and the Contractor shall be
responsible for the accuracy of all lines and grades
relative to the project.
- Protection (c) All work is to be carefully protected so that no
of Work. injury will come to it from water, frost, accident
or other cause, and any injury which may come to the
work is to be repaired by the Contractor.
- Work in (d) Extreme care is to be taken that the work, and all
Progress appurtenances, shall be done carefully, well and
and Final. completely and if later, errors, omissions, or poor
work are discovered they shall be thoroughly repaired
and rectified by the Contractor up to the time of
the acceptance of the entire contract by the Engineers
and the City.
- Sanitary (e) The Contractor is to provide all necessary sanitary
Conveniences. conveniences, properly secluded from public observa-
tion, and shall carry out all directions relating to
same given by the Engineers. The Contractor is
reminded that work will be done on watershed areas
and will require his special attention so that no
waste or other harmful material will enter into the
water supply system. The use of chemically treated
toilets will be required on all watershed areas.
- Care of (f) The Contractor to have charge of, and be liable for
Materials. the loss of, or injury to, any materials delivered to
him, on or in the vicinity of the work, to be used
thereon, and furnish men to handle them for examina-
tion by the Engineers or their assistants; shall keep
trimmed up in piles, so placed as not to endanger the
work, all materials so delivered, whether furnished
by him or the City, and all refuse, rubbish and
materials until removed, and shall not occupy private
land without the approval of the Engineer and per-
mission from the owner or his authorized agent.
- Private Land
not to be
Occupied.

- Lights,
Guards,
etc.
- (g) The Contractor shall at all times leave an unobstructed way along public and private ways for travelers, autos and trucks, and for access to hydrants; shall from the beginning of twilight, through the whole of every night, place and maintain over or near all places in the public or private ways obstructed or made unsafe by the Contractor in doing the work, and over or near all materials for the work placed therein, sufficient lights to protect travelers from injury; shall provide walks for travelers over or around such places and materials; shall not unnecessarily inconvenience the neighboring residents; shall provide all necessary fences, guards and watchmen; shall build bridges and ways for access to property where the existing access is cut off by him, and shall take all proper precautions to protect persons and property from injury by the carrying on of the work.
- Construction
and Labor
Conditions.
- (h) Bidders are required to inform themselves fully of the conditions relating to construction and labor under which the work will be or is now being performed, and this Contractor must employ so far as possible, such methods and means in the carrying out of his work as will not cause any interruption or interference with any other contractor.
- Night,
Sunday or
Holiday
Work.
- (i) No night, Sunday or holiday work requiring the presence of an Engineer or inspector will be permitted, except in case of emergency, and then only to such an extent as is absolutely necessary, and with written permission of the Engineers, provided that this clause shall not operate in case of a gang organized for regular and continuous night work, and on work which, in the opinion of the Engineers, can be satisfactorily performed at night.
- Materials
to be
Removed.
- (j) The Contractor to promptly remove from the work and its vicinity all rejected materials and the surplus earth, refuse, rubbish and excavated materials to spoil areas as shall be directed by the Engineers and shall dispose of them without expense to the City.
- Removal and
Disposal of
Trees.
- (k) No tree shall be removed without the consent of the Engineers and when trees are so designated they shall be removed and disposed of to the satisfaction of the Engineers. Trees not designated for removal shall be protected from damage.

- Existing Bridges. (l) Existing bridges encountered during the progress of the work shall be protected from all damage from Contractor's equipment, blasting, etc.
- Control of Water Supply. (m) Control of the flow of water at dams, reservoirs, spillways, gate houses, etc., shall be controlled by the Engineers. Under no circumstances shall the Contractor change the controls or divert any flow without permission.
- Access to Work. (n) Access roads, ramps, temporary bridges, etc., required during construction shall be built at the discretion of the Contractor and at his own expense, subject to approval by the Engineers.

Section 3. EXCAVATIONS

- Common
Excavation.
- (a) Common excavation shall include the removal and satisfactory disposal of all material, such as clay, sand, gravel, debris, loam, decomposed rock, boulders of less than one cubic yard and trees and stumps designated to be removed by the Engineers. Excavations for foundations shall include all necessary sheeting, dewatering, etc., necessary for the execution of the work. Excavated material suitable for fill may be incorporated into the embankments, otherwise it shall be wasted at spoil areas designated on plans. No separate payment shall be made for common excavation, and all costs in connection therewith shall be included under the applicable lump sum contract prices.
- Ledge and
Rock.
- (b) Ledge requiring blasting for its removal and boulders of one cubic yard or more shall be measured by the Engineers at the point of removal and shall be disposed of in a manner satisfactory to the Engineers. No other material, including soft and disintegrated rock which can be removed without the use of explosives, shall be classified as ledge or rock excavation. Ledge or rock shall be paid for at the contract unit price per cubic yard under Item 22.
- Reservoir
Excavation.
- (c) Reservoir excavation shall include the removal and satisfactory disposal of all material, such as sand, gravel, clay, debris, etc., within the limits of the reservoirs, as shown on plans. Facilities are available so that the reservoirs may be drained and the water level maintained at a minimum during excavation operations. Excavated material suitable for fill may be incorporated into the embankments, otherwise it shall be wasted at spoil areas designated on plans. Reservoir excavation will be required at Winchell, Japhet and Tekoa Reservoirs. All reservoir excavation will be measured in its original position by such methods as the Engineers deem suitable and shall be paid for at the applicable contract unit prices.
- Spoil
Areas.
- (d) Excavated material, including sand, gravel, debris, boulders, etc., to be wasted shall be deposited at spoil areas shown on plans. Spoil areas shall be neatly trimmed, shaped to afford adequate drainage and shall be left in a condition satisfactory to the Engineers.

Section 4. FILL

- General. (a) Fill shall include furnishing and placing all materials and all items of work required for the formation of embankments, roadways, ditches, gutters, and other graded areas, including hauling, placing, rolling, compacting, shaping, etc. Approved excavated material and material from "Borrow Areas" designated on plans will be available for fill. Washed gravel and/or crushed stone required for the work shall be furnished by the Contractor. No separate payment shall be made for fill and all costs in connection therewith shall be included under the applicable lump sum contract prices.
- Placing. (b) Fill shall be placed in horizontal layers of not more than 12-inches before compaction. Each layer shall be spread uniformly by the use of a bulldozer, road machine or other approved device and thoroughly compacted with a crawler-type tractor or power roller. Boulders and ledge to be incorporated in the fill shall be so placed as to have at least 12-inches of cover.
- Borrow Areas. (c) Fill required for the work will be furnished by the City at no expense to the Contractor and will be available at "Borrow Areas" indicated on the plans. Clearing, grubbing, stripping, and removal of all boulders encountered in the excavations at borrow areas will not be measured or paid for separately. Borrow areas shall be neatly trimmed, shaped to afford adequate drainage and shall be left in a condition satisfactory to the Engineers.

Section 5. GROUTED RIP-RAP

- Materials.
- (a) Grout for grouted rip-rap shall consist of one part of Portland cement and three parts of sand, thoroughly mixed with water to produce grout having a thick, creamy consistency. Stone for the rip-rap shall consist of field stone or rough, unhewn quarry stone as nearly rectangular in section as is practicable. The stone shall be dense, resistant to the action of air and water, and suitable in all other respects for the purpose intended. The stones shall weigh between 50 and 150 pounds each and at least 60 per cent of them shall weigh more than 80 pounds each.
- Construction Methods.
- (b) The stones shall be laid with close joints. The courses shall be laid from the bottom of the bank upward, the larger stones being placed in the lower courses. After the stones are in place, the spaces between them shall be completely filled with grout from bottom to top, and the surface swept with a stiff broom. No rip-rap shall be grouted in freezing weather, and in hot, dry weather the work shall be protected from the sun and kept moist for at least three days after grouting.

Section 6. CONCRETE

- Materials. (a) Concrete shall be mixed in the proportion by volume of one part Portland cement, 2 parts sand, 4 parts stone, with a proper amount of suitable water to produce a 2500 lb. test concrete. Cement shall be Portland cement, conforming to the standard specification of the American Society for Testing Materials C-150-49. Sand shall be well graded, clean, sharp, free from foreign matter and proper for concrete construction. Stone shall be crushed stone or screened gravel, clean, hard, strong, uncoated and durable, all passing 1-1/2-inch sieve, well graded and having not more than 5 per cent less than the 1/4-inch size.
- Reinforcing Bars. (b) Reinforcing bars shall be of new billet steel, deformed bars, of sizes shown on drawings. All excess rust and mill scale shall be removed before placing and bars shall be securely wired in place at proper spacing before placing concrete.
- Placing. (c) Water shall be removed from excavations before placing concrete and shall be kept from washing over freshly deposited concrete. Concrete shall be placed in forms and properly vibrated, to entirely fill the forms, without settling coarse aggregates. Concrete that has attained its initial set or concrete that contained its water content for more than 1-1/2 hours shall not be deposited in the work.
- Curing. (d) Concrete surfaces exposed to conditions causing premature drying shall be protected by covering as soon as possible with canvas, straw, burlap or other satisfactory material and kept moist, or if the surfaces are not covered, they shall be kept moist by flushing or sprinkling. Curing shall continue for a period of not less than seven days after placing the concrete.
- Finishing. (e) After removal of forms, all depressions and rod holes shall be filled with mortar. All exposed concrete surfaces shall have high points removed and shall be rubbed until an even, uniform finish is attained.

Section 7. FIELD STONE MASONRY

- Materials. (a) Stone for field stone masonry shall consist of sound, durable, blasted, or field stone, free from seams, cracks and other structural defects and of a shape and quality as approved by the Engineers. Individual stones when set in the walls shall have no face dimension less than 8 inches.
- Mortar. (b) Mortar shall be mixed in the proportion of one part cement to two parts sand. Materials to be as described under "concrete". The mortar shall be used within 45 minutes after mixing. Retempering of mortar will not be permitted.
- Placing. (c) Selected stone, roughly shaped to provide suitable exposed faces, shall be used at all angles and at ends of walls. All shaping of stone shall be done before the stone is placed in the wall. Headers shall occupy at least $1/4$ the face area, shall be evenly distributed through the wall, and shall hold in the heart of the wall. Each stone shall be free from dirt, oil, or any injurious material which may prevent the proper adhesion of the mortar, and shall be wetted before being set in mortar. The wall shall be compactly laid, having all interior joints filled with suitable stones or spalls thoroughly bedded in mortar.
- Pointing. (d) Joints not pointed at the time the stone is laid shall be thoroughly wet with clean water and filled with mortar. The mortar shall be well driven into the joints and finished with an approved pointing tool. The wall shall be kept wet while pointing is being done and in hot or dry weather the pointed masonry shall be protected from the sun and kept wet for a period of at least three days after completion. After the pointing is completed and the mortar set, the wall shall be thoroughly cleaned and left in a neat condition.

Section 8. TIMBER STRUCTURES

- (a) 1. Lumber: The lumber used shall be Douglas Fir, Coast Region, 1700f. - Dense No. 1, or better, according to the specifications of the National Lumber Manufacturers' Association (March, 1952). All lumber used shall be sound, well seasoned and straight grained, free from shakes and large or loose knots and shall have no decayed wood, worm holes, or any defects which, in the opinion of the Engineers, will impair its strength or durability for the purpose intended. Pieces of exceptionally light weight will not be accepted.

The Contractor shall notify the Engineers as to the source of supply of the lumber and he shall also furnish to the Engineers for approval, two certified copies of the grading, made in accordance with the rules of the West Coast Bureau of Lumber Grades and Inspections for Douglas Fir.

Materials.

2. Preservative: All timber used in this contract will be pressure treated with Grade 1 creosote oil. The preservative shall conform to the requirements of the current standard specifications for creosote preservative of the American Wood Preservers' Association. The minimum amount of preservative retained shall be 12 pounds per cubic foot of wood-empty cell.

The Contractor shall notify the Engineers of the name and location of the treatment plant or plants as soon as the Contractor has placed his order for treating lumber. The Contractor shall furnish to the Engineers for approval two copies of a certificate from the treating plant or plants stating that the methods of treatment conform to the requirements specified, and two copies of a certificate giving the chemical analysis of the preservatives. These certificates shall be furnished before any material is placed. Furnishing of the certificates by the Contractor shall not act as a bar to rejection of any materials by the Engineers if he finds that they do not meet the requirements. Any cost involved in furnishing the certificates shall be borne by the Contractor.

3. Fastenings: All fastenings shall be genuine wrought iron or best quality steel. Steel fastenings shall be galvanized by the hot dip method and shall have a continuous coating of pure zinc of uniform thickness weighing not less than 2 ounces per square foot. Washers shall be used under all heads and nuts. They shall be of the same material as the bolts. All nails shall be galvanized. The nuts of all bolts shall be effectually locked after they have been finally tightened.

- (b) 1. Workmanship: Workmanship shall be first class throughout. None but competent carpenters shall be employed and all framing shall be true and exact. Unless otherwise specified, nails and spikes shall be driven with just sufficient force to set the heads flush with the surface of the wood. The workmanship on all metal parts shall conform to the requirements specified for steel structures.

Construction
Methods.

2. Handling: Treated timber shall be carefully handled without sudden dropping, breaking of outer fibers, bruising or penetrating the surface with tools.

3. Framing and Boring: All cutting, framing and boring of treated timbers shall be done before treatment in so far as is practicable. All bolt holes bored after treatment shall be treated with creosote oil. Any unfilled holes, after being treated with creosote oil, shall be plugged with creosoted plugs.

4. Cuts and Abrasions: All cuts in treated timbers and all abrasions, after having been carefully trimmed, shall be covered with two applications of a mixture of 60 per cent creosote oil and 40 per cent roofing pitch or brush coated with at least two applications of hot creosote oil and covered with hot roofing pitch.

Section 9. LOAMING AND SEEDING

- (a) Materials for loaming and seeding operations shall be as follows:

Materials.

1. Loam shall consist of approved, fertile, friable topsoil typical of the locality, without admixture of subsoil, refuse, or other foreign materials. It shall be a mixture of sand, silt and clay, with a normal amount of organic matter, free from stumps, roots, hard dirt, stiff clay, stones larger than 1-inch in diameter, sticks, brush, and other litter. The Contractor shall notify the Engineers of the location of the loam to be used on the job so that its suitability for loaming operations can be determined prior to stripping.

2. Seed mixture shall be as follows:

Chewings Fescue or	
Creeping Red Fescue	25%
Alta Fescue	30%
Domestic Rye Grass	20%
Red Top	15%
White Clover or Alsike	10%

Seed mixture impurity content shall not be higher than 8%.

3. Fertilizer shall be furnished in original containers, plainly marked with chemical analysis and shall have a Nitrogen-Phosphate-Potash, minimum composition by weight of 10-6-4, 8-6-4, or 7-7-7.

Construction Methods.

- (b) Loam shall be furnished, hauled, deposited and spread over such areas as directed by the Engineers, and shall be raked with steel rakes to remove all clods, stones, brush, roots and other foreign matter. Loam shall be placed in depths sufficient to provide a minimum 4-inch depth after compaction. After raking, fertilizer shall be spread on the top layer of loam at the rate of 0.2 pounds per square yard and shall be worked into the top two or three inches of loam, sprinkled with water, and allowed to stand for one day before seeding. Seed shall be sown only between the periods from April 15 to June 1 and from August 15 to October 15, or as directed by the Engineers. Seed shall be evenly sown at the rate of 3.6 pounds per 100 square yards, shall be covered with a thin layer of loam by raking and shall be rolled with hand rollers. After grass has appeared, any area which fails to show a uniform stand of grass shall be reseeded to the satisfaction of the Engineers.

Section 10. GRANVILLE RESERVOIR

Under Item 1, the Contractor shall furnish, place, compact, etc., approximately 15,000 cubic yards of fill in areas shown on plans to be filled. Special care shall be taken in filling around the existing exposed cast iron water main so as not to damage the pipe or break the joints. Fill around the pipe shall be hand tamped to provide a suitable foundation for the pipe. Hand tamping will also be required to compact fill in the washed out areas under the existing concrete spillway channel.

Under Item 2, the Contractor shall excavate and dispose of all material in and around the existing by-pass channel. Special care shall be taken in excavating around the existing concrete and masonry portion of the channel so that no further damage results. Location and elevations of existing channel are approximate and proposed grading adjacent to channel will be adjusted to meet existing conditions after excavation. Repairs to the channel will also be included under this item.

Under Item 3, the Contractor shall repair and replace portions of the existing concrete spillway channel, including installation of the open joint underdrain and surrounding drainage fill, tile wall drains, and miscellaneous items of work.

Under Item 4, the Contractor shall loam and seed all graded areas shown on plans and washed out areas shown on plans. The Contractor shall also fill where necessary and loam and seed the washed out areas on the downstream face of the dam and the areas adjacent to the south end of the dam. Approximately 10,000 square yards of loaming and seeding will be required.

Section 11. WINCHELL RESERVOIR

Under Item 5, the Contractor shall furnish, place, compact, etc., approximately 1,100 cubic yards of fill required along sides of existing spillway channel, as shown on plans. Fill required in washed out bottom of spillway channel shall be included under Item 6.

Under Item 6, the Contractor shall fill washed out bottom of spillway channel and furnish and place grouted rip-rap therein, shall construct rip-rap channel walls, as shown on plans, and shall excavate channel, as shown on plans.

Under Item 7, the Contractor shall furnish and install approximately 1,400 square yards of loaming and seeding for all graded areas shown on plans.

Under Item 8, the Contractor shall excavate sand, gravel, boulders, debris, etc., from within the limits of the reservoir, as shown on plans.

Section 12. JAPHET RESERVOIR

Under Item 9, the Contractor shall fill, loam and seed the washed out area adjacent to the existing masonry dam, including all grading, rolling, compacting, etc.

Under Item 10, the Contractor shall excavate sand, gravel, boulders, debris, etc., from within the limits of the reservoir, as shown on plans. Special care shall be taken so as not to damage the existing paved bottom of the reservoir, and any damage resulting shall be repaired at the Contractor's expense.

Section 13. MONTGOMERY RESERVOIR

Under Item 11, the Contractor shall fill washout at end of dam and shall fill, loam and seed washed out areas along masonry wall and areas on downstream face of dam.

Section 14. BRIDGE NO. 2

Under Item 12, the Contractor shall fill washed out areas adjacent to bridge, including rolling, grading, compacting, etc.; shall repair existing masonry abutments; shall remove fallen trees adjacent to bridge and shall clear all sand, gravel, debris, etc., from bridge deck.

Section 15. BRIDGE NO. 1

Under Item 13, the Contractor shall fill washed out areas adjacent to bridge, including rolling, grading, compacting, etc.; shall repair existing masonry abutments; shall construct timber bridge; shall clear channel at bridge of trees, remains of old bridge, gravel, boulders, debris, etc. Boulders of 1 cubic yard or more to be removed from the channel shall be paid for under Item 22.

Section 16. TEKOA BRIDGE

Under Item 14, the Contractor shall furnish and install all materials necessary to construct concrete abutments and timber bridge. Excavation and backfill required will be included under Items 15 and 16.

Section 17. TEKOA RESERVOIR

Under Item 15, the Contractor shall furnish, place, compact, etc., approximately 2,500 cubic yards of fill required at areas shown on plans. Special care shall be taken to provide a suitable foundation for the existing exposed cast iron drain at the end of the dam.

Under Item 16, the Contractor shall excavate approximately 900 cubic yards of material for the spillway channel, to the lines and grade shown on plans.

Under Item 17, the Contractor shall furnish and install approximately 5500 square yards of loaming and seeding for all graded areas shown on plans.

Under Item 18, the Contractor shall excavate sand, gravel, boulders, debris, etc., from within the limits of the reservoir as shown on plans.

Under Item 19, the Contractor shall furnish and place all materials necessary to construct diversion dam at upper end of reservoir; shall remove superstructure and install concrete slab at the existing valve house; shall remove sand, gravel, debris, etc., from existing valve house, and shall repair the damaged portions of the chain link fence and cast iron drain at the end of the dam.

Section 18. ROADWAYS

Under Item 20, the Contractor shall fill, regrade and shape about 5.5 miles of roadways shown on Drawing No. 1. Roadway washout near Winchell Reservoir, indicated on plan, shall be repaired by the City. The Contractor shall also clean out all existing corrugated metal and stone box culverts along these roads and shall remove fallen trees and overhanging branches from the path of the roadways. It is the intention of this specification to restore these roads to original condition, shaped to afford proper drainage and passable.

Section 19. HUMBURT GUTTER

Under Item 21, the Contractor shall repair the existing masonry culvert, fill over the existing cast iron water main and excavate sand, gravel, debris, etc., from the existing channel, as shown on plans.

Section 20. CHAPIN POND

Under Item 23, the Contractor shall furnish and install all materials necessary for the construction of the earth dam, including manhole, valve, piping, concrete walls, rip-rap, roadway, loaming and seeding, etc., as shown on plans.

Section 21. MISCELLANEOUS

- (a) The Contractor shall take out and maintain during the life of this contract Workmen's Compensation Insurance for all employees employed at the site of the project, in the manner and to the extent provided for in Chapter 152 of the General Laws and amendments thereto.

Insurance
Requirements.

Precaution shall be exercised at all times for the protection of persons and property. Contractor and subcontractors to furnish the Engineers with three copies of certificate of insurance covering each policy applicable.

The minimum amount of insurance shall be as follows:

Contractor: Public Liability Insurance

not less than \$15,000 for insurance including wrongful death to any one person and subject to the same limit for each person in an amount not less than \$30,000 on account of one accident.

Subcontractor: Public Liability Insurance

not less than \$15,000 for insurance including wrongful death to any one person and subject to the same limit for each person in an amount not less than \$30,000 on account of one accident.

Contractor: Property Damage Insurance - Contractor shall also provide property damage coverage, including damage from blasting, in the amount of \$10,000 on account of one accident and \$20,000 in the aggregate.

Sub-contractor: Property Damage Insurance - Sub-contractors shall also provide property damage coverage, including damage from blasting, in the amount of \$10,000 on account of one accident and \$20,000 in the aggregate.

The Contractor and Sub-contractors may omit from the Property Damage Insurance the including of damage from blasting, and provide in place thereof a satisfactory "blasting bond".

Reserve
Police
Officer.

- (b) Any reserve police officer employed by the Contractor shall be paid the prevailing wage rates paid to regular police officers of the City of Westfield.

ARTICLE 5. The Contractor shall, within seven days after the approval as to final execution of this Contract, commence work at such point or points as the Engineers shall direct and shall thereafter continue at such point or points and in such order or procedure as they may from time to time direct.

The rate of progress shall be regular and consistent and shall be such that the whole work shall be performed in accordance with the terms of this contract within the time of completion specified in Article 4, Section 1 (g). The time in which this contract is to be performed and the work is to be completed is of the essence of this agreement.

Time.

It is agreed that the rate of progress herein required has been purposely made low enough to allow for the ordinary delays incident to the seasonal as well as other difficulties of construction work of this character. No extension of time will be made for ordinary delays, inclement weather and accidents, and the occurrence of such will not relieve the Contractor from the necessity of maintaining this rate of progress.

If delays are caused by acts of God, acts of Government or State, strikes, extra work or other contingencies clearly beyond the control or responsibility of the Contractor, the Contractor shall be entitled to so much additional time wherein to perform and complete this Contract on his part as the Engineers shall certify in writing to be just.

The Contractor shall promptly start the work to be done under this Contract and shall continue it to completion with all practical dispatch.

ARTICLE 6. The Board and the Engineers, agents and employees of the Board or City, may, for any purpose, enter upon the work and premises used by the Contractor, and the Contractor shall provide safe and proper facilities therefor. The other agents, employees or Contractors of the City may also, for all purposes which may be required by their work or Contract, enter upon the work and any differences or conflicts which may arise between the Contractor and other workmen or Contractors of the City in regard to their work shall be adjusted by the Engineers.

Access to
Work.

The Board and the Engineers, agents and employees of the Board or City may inspect at the point of manufacture any materials to be used in the work and reject such materials as are not satisfactory.

Defective
Work,
Approvals,
etc.

ARTICLE 7. The inspection and/or approval of the work, or any part of the work, shall not relieve the Contractor of any of his obligations to fulfill his contract as herein prescribed and defective work shall be made good and unsuitable materials and equipment may be rejected notwithstanding that such work, materials and equipment or drawings of same have been previously overlooked or approved by the Engineers and accepted or estimated for payment. If the work or part thereof shall be found defective and/or unsatisfactory at any time before the final acceptance of the whole work, the Contractor shall forthwith make good such defect in a manner satisfactory to the Engineers, and if any materials brought upon the ground for use in the work, or selected for the same, shall be condemned by the Engineers as unsuitable or not in conformity with the specifications, the Contractor shall forthwith remove such materials from the vicinity of the work.

Employees
to be
Competent.

ARTICLE 8. The Contractor shall employ only competent men to do the work and whenever the Engineers shall notify the Contractor that any man on the work is, in his opinion, incompetent, unfaithful disorderly, or otherwise unsatisfactory, such man shall be discharged from the work and shall not again be employed on it, except with the consent of the Engineers.

Not to
Assign or
Sublet.

ARTICLE 9. The Contractor shall give his personal attention constantly to the faithful prosecution of the work, shall keep the same under his personal control and shall not assign, by power of attorney or otherwise, nor sublet the work or any part thereof, without the previous written consent of the Board, and shall not, either legally or equitably, assign any of the moneys payable under this agreement, or his claim thereto, unless by and with the like consent of the Board.

Alterations.

ARTICLE 10. The Engineers may make alterations in the line, grade, plan, form, dimensions or materials of the work, or any part thereof, either before or after the commencement of construction; if such alterations diminish the quantity of work to be done, they shall not warrant any claim for damages or for anticipated profits on the work that may be dispensed with; if they increase the amount of work, such increase shall be paid for according to the quantity actually done at the price stipulated for such work under this contract.

ARTICLE 11. The Contractor shall take all responsibility of the work and take all precautions for

Responsibility.

preventing injuries to persons and property in or about the work; shall bear all losses resulting to him on account of the amount or character of the work, or because the nature of the land in or on which the work is done is different from what was estimated or expected, or on account of the weather, elements or other cause and he shall assume the defense of and indemnify and save harmless, the City and its officers, agents and servants, from all claims relating to labor and materials furnished for the work; to inventions, patents and patent rights used in doing the work; to injuries to any person or corporation or property received or sustained by or from the Contractor and his employees in doing the work, or in consequence of any improper materials, implements or neglect of the Contractor and his employees therein.

Abandonment
of Work, etc.

ARTICLE 12. If the work to be done under this Contract shall be abandoned, or if this Contract or any part thereof shall be sublet, without the previous written consent of the Board, or if the Contract or any claim thereunder shall be assigned, by the Contractor otherwise than as specified herein, or if at any time the Engineers shall be of opinion, and shall so certify in writing to the Board, that the conditions herein specified as to the rate of progress are not fulfilled or that the work or any part thereof, is unnecessarily or unreasonably delayed or that the Contractor has violated any of the provisions of this Contract, the Board may notify the Contractor to discontinue all work or any part thereof, and thereupon the Contractor shall discontinue such work or such part thereof, as the Board may designate, and the Board may thereupon by contract or otherwise, as they may determine, complete the work or any part thereof, and charge the entire expense of so completing the work or part thereof, to the Contractor, and for such completion the City for itself or for its contractors, may take possession of and use or cause to be used in the completion of the work or part thereof any materials, machinery, implements and tools of every description as may be found upon the line of said work. All expenses charged under this Article shall be deducted and paid by the City out of any moneys then due or to become due the Contractor under this Contract, or any part thereof; and in the accounting thereof the City shall not be held to obtain the lowest figures for the work of completing the Contract or any part thereof, or for insuring

Abandonment
of Work, etc.

the proper completion, but all sums actually paid therefor, shall be charged to the Contractor. In case the expenses so charged are less than the sum which would have been payable under this Contract if the same had been completed by the Contractor, the Contractor shall be entitled to receive the difference; and in case such expense shall exceed the said sum, the Contractor shall pay the amount of excess to the City.

Damages for
Delay.

ARTICLE 13. The Contractor shall pay to the City all expenses, losses and damages, as determined by the Engineers, incurred in consequence of any defect, omission or mistake of the Contractor or his employees, or the making good thereof and shall also pay, for each and every calendar day that he shall be in default in completing the work as herein provided, the sum of Forty Dollars (\$40.00), which sum is hereby agreed upon, not as a penalty but as the damages which the City will suffer daily by reason of such default.

ARTICLE 14. The City may at any time, by a written order, and without notice to the sureties, require the performance of such Extra Work or changes in the work as it may find necessary or desirable. The amount of compensation to be paid to the Contractor for any extra work, as so ordered, shall be determined as follows:

Extra
Work.

(a) By such applicable unit prices, if any, as are set forth in the Contract; or by such unit prices as may be agreed upon between the City and the Contractor;

(b) If no such unit prices are so set forth, or, if no unit price is agreed upon between the City and the Contractor, then by a lump sum mutually agreed upon by the City and the Contractor; or

(c) If no such unit prices are so set forth, or, if no unit price is agreed upon between the City and the Contractor, and if the parties cannot agree upon a lump sum then by the actual net cost in money to the Contractor of the materials and of wages of applied labor (including premiums for Workmen's Compensation Insurance) required for such extra work, plus such rental for plant and equipment (other than small tools) required and approved for such extra work, plus fifteen per centum (15%) as compensation for all other items of profit, and costs or expense including administration, overhead,

Extra
Work.

superintendence, insurance (other than Workmen's Compensation Insurance), materials used in temporary structures, allowances made by the Contractor to sub-contractors, additional premiums upon the performance bond of the Contractor and the use of small tools. The provisions hereof shall not affect the power of the Contractor to act in case of emergency, as hereinafter provided.

Contractor's
Claims.

If the Contractor claims compensation for extra work not ordered as aforesaid, or for any damage sustained, he shall, within one week after the beginning of any such work or sustaining of any such damage, make a written statement to the Engineers of the nature of the work performed or damages sustained, and shall, on or before the fifteenth day of the month succeeding that in which any such damage shall have been sustained, file with the Engineers an itemized statement of the details and amount of such work or damage; and unless such statements shall be made as so required, his claim for compensation shall be forfeited and invalid, and he shall not be entitled to payment on account of any such work or damage. The determination of the Engineers shall be final upon all questions of the amount and value of extra work, but in no greater amount than is approved in writing by the Board.

Money to be
Retained.

ARTICLE 15. The City may keep any moneys which would otherwise be payable at any time hereunder and apply the same, or so much as may be necessary therefor, to the payment of any expenses, losses or damages incurred by the City and determined as aforesaid and may retain until all claims are settled, so much of such moneys as the Board shall be of opinion will be required to settle all claims against the City, its officers, agents or servants, specified in Article 11.

Prices for
Work.

ARTICLE 16. The City shall pay and the Contractor shall receive as full compensation for everything furnished and done by the Contractor under this Contract, including all work required but not included in the items hereinafter mentioned, and also for all loss or damage arising out of the nature of the work aforesaid, or from the action of the elements, or from any unforeseen obstruction or difficulty encountered in the prosecution of the work, and for all expenses incurred by or in consequence of the suspension of the work as herein specified and for well and faithfully completing the work, and the whole thereof, as herein provided as follows:

Item 1. For furnishing and placing fill at Granville Reservoir, including all necessary grading, rolling, compacting and other incidental items of work required for the formation of embankments, roadways and other graded areas, the lump sum of _____

Dollars (\$)).

Item 2. For excavating the existing by-pass channel and adjacent areas at Granville Reservoir, including repairs to existing concrete and masonry by-pass channel, and other incidental items of work, the lump sum of _____

Dollars (\$)).

Prices for
Work.

Item 3. For furnishing and installing concrete at Granville Reservoir to restore damaged walls and slab of spillway channel to original lines and grade, including all underdrains, form work, finishing, etc., the lump sum of _____

Dollars (\$)).

Item 4. For furnishing and placing loaming and seeding at Granville Reservoir, including all loaming, seeding, rolling, etc., the lump sum of _____

Dollars (\$)).

Item 5. For furnishing and placing fill at Winchell Reservoir, including all necessary grading, rolling, compacting, and other incidental items of work required for the formation of embankments, and other graded areas, the lump sum of _____

Dollars (\$)).

Item 6. For furnishing and placing all materials at Winchell Reservoir required to restore the spillway channel to original lines and grade including all fill, excavation, rip-rap, etc., the lump sum of _____

Dollars (\$)).

Prices for
Work.

- Item 7. For furnishing and installing loaming and seeding at Winchell Reservoir, including all loaming, seeding, rolling, etc., the lump sum of _____ Dollars (\$ _____).
- Item 8. For excavating and disposing of each cubic yard of reservoir excavation at Winchell Reservoir, the sum of _____ Dollars (\$ _____).
- Item 9. For furnishing and placing fill at Japhet Reservoir, along with loaming and seeding, including all necessary grading, rolling, compacting, etc., all in the area adjacent to the masonry dam, the lump sum of _____ Dollars (\$ _____).
- Item 10. For excavating and disposing of each cubic yard of reservoir excavation at Japhet Reservoir, the sum of _____ Dollars (\$ _____).
- Item 11. For incidental items of work at Montgomery Reservoir, including filling washout atop dam, and along masonry wall atop dam, and loaming and seeding washed out areas along downstream face of dam, the lump sum of _____ Dollars (\$ _____).
- Item 12. For furnishing and placing all materials at Bridge No. 2 required to restore to original lines and grade, including all fill, excavation, rolling, compacting, repair of masonry abutments, and other incidental items of work, the lump sum of _____ Dollars (\$ _____).

Prices for
Work.

- Item 13. For furnishing and installing all material at Bridge No. 1 required to restore to original lines and grade, including all fill, excavation, rolling, compacting, construction of abutments and timber bridge, and other incidental items of work, the lump sum of _____

Dollars (\$)).

- Item 14. For furnishing and installing all materials at Tekoa Bridge required to construct concrete abutments and timber bridge, and other incidental items of work, the lump sum of _____

Dollars (\$)).

- Item 15. For furnishing and placing fill at Tekoa Reservoir, including all necessary grading, rolling, compacting, and other incidental items of work required for the formation of embankments, roadways, and other graded areas, the lump sum of _____

Dollars (\$)).

- Item 16. For excavating spillway channel at Tekoa Reservoir, including removal of trees and disposal of all materials and other incidental items of work, the lump sum of _____

Dollars (\$)).

- Item 17. For furnishing and placing loaming and seeding at Tekoa Reservoir, including all loaming, seeding, rolling, etc., the lump sum of _____

Dollars (\$)).

- Item 18. For excavating and disposing of each cubic yard of reservoir excavation at Tekoa Reservoir, the sum of _____

Dollars (\$)).

Prices for
Work.

Item 19. For incidental items of work at Tekoa Reservoir including construction of diversion dam; removing superstructure; placing concrete roof slab and removal of sand, gravel and debris at the existing valve chamber; and repairing chain link fence atop the dam, the lump sum of _____

_____ Dollars (\$ _____).

Item 20. For regrading, filling and shaping existing roadways shown on plans, and other incidental items of work in connection therewith, the lump sum of _____

_____ Dollars (\$ _____).

Item 21. For work at Humbert Gutter, including excavating channel, filling over water main and repairing masonry culvert, the lump sum of _____

_____ Dollars (\$ _____).

Item 22. For each cubic yard of ledge and boulder excavation at Granville, Winchell, Japhet, Montgomery and Tekoa Reservoirs, at bridge sites, and at Humbert Gutter, the sum of _____

_____ Dollars (\$ _____).

Item 23. For furnishing and installing all materials at Chapin Pond necessary for the construction of the earth dam, roadway, manhole, piping, rip-rap, etc., including all grading, rolling, compacting and incidental items of work, the lump sum of _____

_____ Dollars (\$ _____).

Item 24. For extra work and materials furnished under order in writing by the Engineers, on their usual stationery, the City will allow such increased compensation as referred to in Article 14.

Laws and
Regulations.

ARTICLE 17. The Contractor shall keep himself fully informed of all State and National laws, and municipal ordinances and regulations in any manner affecting those engaged or employed in the work, or the materials used in the work, or in any way affecting the conduct of the work and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the specifications or Contract for this work in relation to any such law, ordinance, regulation, order or decree, he shall forthwith report the same to the Engineers in writing. He shall at all times himself observe and comply with, and shall cause all his agents and employees to observe and comply with, all such existing and future laws, ordinances, regulations, orders and decrees; and shall protect and indemnify the City and the Board and their officers and agents against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by himself or his employees.

State and
Federal.

All the materials furnished and work done are to comply with all State and Federal laws and regulations.

Hours of
Work.

ARTICLE 18. In the employment of mechanics, teamsters, chauffeurs and laborers in the construction of this public works, the Contractor shall give preference, first, to citizens of the Commonwealth who have served in the army or navy of the United States in time of war and have been honorably discharged therefrom or released from active duty therein, and who are qualified to perform the work to which the employment relates; and secondly, to citizens of the Commonwealth generally, and, if they cannot be obtained in sufficient numbers, then to citizens of the United States. Preference shall be given to veterans and citizens who are residents of the City of Westfield, Mass. No laborer, workman, mechanic, foreman or inspector working within this Commonwealth in the employment of the Contractor, subcontractor, or other person doing or contracting to do the whole or a part of the work contemplated by this Contract, shall be required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of extraordinary emergency. Every employee in the work covered by this Contract shall lodge, board and trade where and with whom he elects, and neither the Contractor nor his agents or employees shall, directly or indirectly, require as a condition of employment therein, that the employee shall lodge, board or trade at a particular place or with a particular person.

In re Lodge,
Board or
Trade.

Contractor
to Pay All
Claims for
Labor, etc.

ARTICLE 19. The Contractor further agrees that he will pay for all labor performed or furnished, and for all material used or employed, including lumber used on the project but not incorporated in the work, and for the rental or hire of vehicles, steam shovels, rollers propelled by steam or other power, concrete mixers, tools and other appliances and equipment used or employed in the carrying out of this contract, and shall pay all persons who contract with the principal for labor and materials on account of the work herein contemplated and that he will furnish the Board at its request with evidence satisfactory to the Board that all persons who have done work or furnished anything under this contract and all claims of private corporations or individuals for damage of any kind caused by the construction of said work have been fully paid or satisfactorily secured and in case such evidence is not furnished the Board may cause to be retained out of any amount due the Contractor sums sufficient to cover any such unpaid claims. While it is understood that the security required to be given by the Contractor to satisfy the conditions of statute law by his giving the bond accompanying this contract, the City may nevertheless cause any moneys retained or to become due to be held and applied to the payments for labor or materials for which security is required under the provisions of law.

Payments to
Contractor.

ARTICLE 20. The City, so long as the Contractor continues to carry on the work, shall make monthly payments therefor as follows: The Engineers shall each month prior to the completion of the work estimate the value of the work done to the date of the estimate and thereupon the City shall deduct from such estimate ten per cent (10%) thereof, all previous payments, all amounts to be kept under the preceding Articles and shall pay the balance of such estimate to the Contractor; shall ninety-one (91) days after the completion of the work estimate the total amount to be allowed under the preceding Articles and thereupon the City shall deduct from such amount one per cent (1%) thereof, all previous payments and all amounts to be kept under the preceding Articles, and shall pay the balance to the Contractor, and shall six months after the completion of the work deduct from the amount of said one per cent (1%) and keep for its own all expenses incurred by the City on account of defects, omissions or mistakes of the Contractor in the work, discovered by the Engineers since the preceding payment and pay the balance to the Contractor.

City not
to be
Liable.

ARTICLE 21. The City shall not be liable to the Contractor except as provided in the preceding Articles, and on making the last payment aforesaid, shall be released from all claim or liability to the Contractor for anything done or furnished for or relating to said work, or for any acts or neglect of the City or of any person relating to or affecting said work, except for the remainder, if any there be, of the amounts retained as aforesaid.

Wage Rates.

ARTICLE 22. In compliance with Chapter 461, Acts of 1935, the following Classifications of Labor and Minimum Wage Rates applying thereto, have been established by the Department of Labor and Industries of the Commonwealth of Massachusetts.

<u>Classifications of Occupations</u>	<u>Rate per Hour</u>
Hoisting Engineer	\$3.00
Assistant Engineer: On Steam Machines	2.40
On Other Machines	2.10
Crane Operator	3.00
Power Shovel Operator	3.00
Trenching Machine Operator	3.00
Tractor Operator	2.55
Bulldozer Operator	2.55
Grader Operator	2.55
Compressor Operator - 220 cu. ft. or less	2.00
Over 220 cu. ft.	2.45
Jack Hammer Operator	2.15
Roller Operator	2.47-1/2
Concrete Mixer Operator - 1 bag	1.90
2 bags or more..	2.40
Pumpman	2.45
Other Power Driven Equipment	2.47-1/2
Bricklayer	3.27-1/2*
Cement Finisher	3.27-1/2*
Stone Cutter	2.25
Stone Mason	3.27-1/2*
Mason Tender	2.15
Catch Basin & Manhole Builder	3.27-1/2*
Carpenter	2.77-1/2**
Pile Driver & Cofferdam Builder	2.85
Iron Worker	3.38***
Painter	2.55
Blaster	2.40
Truck Driver	2.19-1/2
Euclid Operator	2.45

* After 9-1-56, \$3.37-1/2

** After 6-1-56, \$2.82-1/2

*** After 7-1-56, \$3.53

	Classifications of Occupations	(Continued)	Rate per Hour
Wage Rates	Pipe Layer		\$1.90
	Stone Spreader		1.90
	Asphalt Raker		1.90
	Curb Setter		2.05
	Common Laborer		1.90
	Water Boy		1.00
	Electrician		3.05
	Granite Cutter		3.08
	Operator of 3 axle equipment		2.25

IN WITNESS WHEREOF, the parties to these presents have caused these presents to be signed and sealed this _____ day of _____ in the year nineteen hundred and fifty-six.

City of Westfield, Mass. {

By its {

Board of Public Works {

Contractor

By _____

(If the Contractor is a partnership, fill out the following, giving the full name of each partner.)

The above contracting _____ consists of the following members:

_____ residing _____

_____ residing _____

_____ residing _____

(If the Contractor is a corporation, give its place of organization, its president and treasurer.)

Place of Organization _____

President _____

Treasurer _____

BOND

KNOW ALL MEN BY THESE PRESENTS,

That we,
an individual a partnership a corporation organized under the
laws of the State of having an usual place
of business in as principal, and
..... a corporation organized
under the laws of the State of and having
an usual place of business in as surety,
are holden and stand firmly bound and obligated unto the City of
Westfield, Mass., as obligee in the amount of

.....
Dollars (\$), lawful money of the United States of America
to and for the true payment whereof we bind ourselves, and each of us,
our heirs, executors, administrators, successors and assigns, jointly
and severally, firmly by these presents.

WHEREAS, the said principal has by means of a written agreement
dated, 1956, entered into a contract with the said
obligee for Repairs to Water Supply System, and all incidental work,
a copy of which agreement is attached hereto and by reference made a
part hereof.

NOW THE CONDITION of this obligation is such that if the said
principal shall well and truly keep and perform all the agreements,
terms and conditions of said contract on his part to be kept and
performed and shall also pay for all labor performed or furnished,
and for all material used or employed including lumber used on the
project but not incorporated in the work, and for the rental or hire
of vehicles, steam shovels, rollers propelled by steam or other power,
concrete mixers, tools, and other appliances and equipment used or
employed in the carrying out of said contract, and shall pay all
persons who contract with the principal for labor and materials, then
this obligation shall be void; otherwise it shall remain in full
force and virtue.

And the said surety, for value received, hereby stipulates and
agrees that no change in, or extension of time, alteration or addition
to the terms of the contract or to the work to be performed thereunder
or the specifications accompanying the same shall in any wise affect
its obligations on this bond and it does hereby waive notice of any
such change, extension of time, alteration or addition to the terms
of the contract or to the work or to the specifications.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this
_____ day of _____ in the year One Thousand, Nine
Hundred and Fifty-Six.

(Principal) (Seal)
By _____

See Default Agreement
attached, to be executed
by Surety.

(Surety) (Seal)
By _____

DEFAULT AGREEMENT

(Name of Company Furnishing Bond)

(Applicable Branch Office Address)

(Office Address of Undersigned)

(Date)

Contractor: _____

Contract: _____

(Municipality)

(State)

Bond # _____

Gentlemen:

This is to advise that in the event the principal on the above captioned bond shall be in default, and the _____ (Municipality) so declares him in default and terminates his right to proceed under the contract as referred to in the bond, (the _____ (Municipality) having performed its obligations under said contract), and the _____, shall further request the _____ (Municipality) (Surety) as Surety, to take over and complete the said contract, the _____ (Surety) will exert every effort to secure bids from other contractors for the completion of the said contract and the work thereunder. If successful in securing satisfactory bids, the _____ (Surety) will award a contract for the completion of the work to the lowest responsible bidder who can furnish

bond, and who is mutually acceptable to the _____
and the _____ (Municipality). This is on condition,
(Surety)
however, that the lowest acceptable bid for the completion of the
original contract, plus outstanding labor and material bills and
other obligations of the principal for which the Surety may be
liable, less the remaining unpaid balance under the contract,
shall not exceed the penalty of the Surety's bond, and on the
further condition that _____ recognizes the right
(Municipality)
of the _____ to all balances re-
(Surety)
maining unpaid under the said contract, earned or unearned, and
agrees to pay such balances over to the _____
(Surety)
as the work progresses, and periodically as called for by the
original contract between the principal, as herein referred to,
and the _____.
(Municipality)

Very truly yours,

Attorney-in-Fact.

Westfield Dam Inspections - 1957 - 1970



1957 Reports

Inspections by Tighe & Bond.

Abutters

Stanley Park

Bridges

Horton's Bridge

City/Town

Westfield

Dam

Logie Dam

Dam

Florek Dam

Dam

Pieczarka Realty Dam

Dam

Kulper Dam

Dam

Arm Brook Dam

Dam

Powder Mill Brook Dam

Dam

Stanley Home Products Dam

Dam

Westfield City Parks Dams

Dam

Springfield Water Works West Parish Filter Dam #3

Dam

Stanley Park Dam

Dam

Westfield Sportsmen's Club Dam

Dam

Boy Scout Dam

Dam

Zombic Dam

Dam

Stevens Paper Company Dams

Dam

Foster Machine Company Dam

Dam	Westfield City Water Dam
Dam	Tekoa Dam
Dam	Socony Dam
Dam	Springfield City Water Works Dams
Dam	Wilgus Dam
Dam	Y M C A Dam
Dam	Horse Pond Dam
Dam	Westfield City Public Works
Dam	Girl Scout Dam
Dam	Springfield Water Works Intake Dam
Dam	Springfield Water Works West Parish Filter Dam #2
Dam	Cook Dam
Dam	Gillett Dam
Dam	Smith Dam
Dam	Springfield Water Works West Parish Filter Dam #1
Dam	Lane Dam
Dam	Chapin Pond Dam
Streets	Mountain Road
Streets	Little River Road
Streets	Granville Road
Water	Ashley Brook
Water	Moose Meadow Brook

Water	Hampton Ponds
Water	Pond Brook
Water	Horse Pond
Water	Cook's Brook
Water	Powder Mill Brook
Water	Arm Brook
Water	Munn Brook
Water	Great Brook
Water	Pequot Pond
Water	Little River
Water	Bush Brook
Water	Sandy Mill Brook

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, Inc.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

C.D.
January 30, 1957

The Hon. The Board of County Commissioners
37 Elm Street
Hampden County Court House
Springfield, Mass.

Gentlemen:

Inspections carried on in the City of Westfield during the year 1956 have resulted in all dams in that community having been examined one or more times during the year. The following is a report on the condition of the various dams situated in Westfield.

A. Horse Pond Dam, Westfield Dept. of Public Works

This is a small earth dam with a stone masonry spillway that is the outlet to Hampton Ponds located partly in Westfield and partly in Southampton. Though the dam is very small and low, the quantity of water impounded is quite large because of the large surface area formed by both Horse Pond and Pequot Pond of the Hampton Ponds group. No damage was done to this dam during the flood of August, 1955. Water passed over the dam but the sod and root growth on the shallow embankment prevented any washout occurring. When last inspected, this dam was found to be in good condition.

B. Chapin Pond Dam

This is a relatively large earth dam with a channel spillway located at the left end. The dam is situated westerly of Mountain Road on Pond Brook, a short distance downstream from Hampton Ponds. The dam and pond are the property of the City of Westfield. In the flood of August, 1955, a large breach was washed thru the dam. This breach has been repaired as a flood project and the dam improved. The structure was inspected from time to time during repairs and when last checked, all repair work had been completed and the dam was in good condition.

C. Westfield Park Dept. Upper Dam

This is a masonry overflow structure with earth embankments located on Sandy Mill Brook at a point downstream from the confluence of Pond Brook and Bush Brook. In recent years, the dam has been used for aesthetic and recreational purposes. During the flood of August, 1955, a major washout occurred around

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the right end of the masonry spillway thru the earthen portion of the embankment. This washout is large enough in width and deep enough to prevent the ponding of any water. The canal dike adjacent to the dam and immediately downstream was also breached by the flood water. When last inspected, the breaches in the dam and in the canal wall were wide enough and free enough to prevent the ponding of any water. A free waterway exists at this dam and, consequently, the structure was satisfactory when last inspected.

D. Westfield Park Dept. Canal Wall and Outlet Structure at Southerly End of Park

These structures no longer impound water as a result of the breach thru the dam described in C. above. When last inspected, these structures were in satisfactory condition, considering the fact that no water would be impounded behind them.

E. Westfield Park Dept. Lower Dam

This is a stone masonry structure situated in the narrow and relatively deep portion of the valley of Sandy Mill Brook at a point approximately 2,000 ft. downstream from the dam described in C. above. For a number of years, this dam has had no practical use. The quantity of water stored behind the dam has always been small because of the narrow valley, the shallow depth of the dam and the fact that the pond area behind the dam has been filled in with sand, gravel, and silt washed down from upstream. In the flood of August, 1955, excess stream flow washed around the left abutment, but this did not cause a failure of the dam. When last inspected, the dam was in its normal and usual condition. The pond behind the dam is now almost entirely filled with deposits from upstream and no water of consequence is stored. In view of this fact, the structure seems satisfactory at the present time.

F. Boy Scout Dam This is an earth and masonry structure that is relatively high but impounds a small volume of water on a tributary to Great Brook in the southeasterly portion of Westfield. The dam is located just westerly of Little River Rd. and is used for recreational purposes. In the flood of August, 1955, a washout occurred downstream of the dam adjacent to the spillway. At that time, the caretaker was notified of the condition and told to have the condition repaired. Proper repairs have not been carried out and even when last inspected in 1956 the washout still needed attention. At that time, the caretaker was contacted and notified to drain the pond until proper repairs could be made. It is recommended that the owner of the structure be advised of this condition in writing and that no water be ponded at the dam until it has been repaired and the repairs inspected and approved.

G. Socony Dam

This was a masonry structure located on Powder Mill Brook just upstream from Route 202. The dam has not ponded water for

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a number of years. In fact, the structure has been breached but since it is located in a narrow valley, its condition has been inspected annually. The flood waters of August, 1955, washed away more of the remaining masonry and formed a large gap in the valley at the site of the dam. When last inspected, no structure remained at this site that would impound water. A free waterway exists for the brook.

H. Westfield Sportsmen's Club Dam

This is an earth embankment with a masonry spillway located on a tributary to Powder Mill Brook at a point westerly of Montgomery Road. The pond formed by the dam has been used for recreational purposes by the Sportsmen's Club. During the flood of August, 1955, a large section of the earth embankment was washed thru by the flood water. As a result of this breach, a relatively free waterway was formed on the brook. Since the flood, plans have been prepared and examined for repairs to this dam. During the past year, the request for permission to repair the dam has been withdrawn and apparently the structure will not be reactivated. When last inspected, the breach existed at the dam and a free waterway was available for passage of flow in the brook. No pond is formed at this site.

I. Zombic Dam

This was a small earthen dam having a tube and a swale type of spillway situated downstream from the last dam described at a point easterly of Montgomery Road and just upstream of the mouth of the brook at Powder Mill Brook. The dam was built not too long prior to the flood of August, 1955, for private recreational purposes by Mr. Zombic. The dam was situated in a narrow and deep portion of the brook valley where the sides and bottom of the valley were of a sand and gravel material. In the flood of August, 1955, the dam was washed away. No trace of the structure remained following the flood. When last inspected, a free waterway existed at the site of this dam.

J. Tekoa Dam of the Westfield Water Dept.

This dam is situated on Moose Meadow Brook and is actually just over the town line in Montgomery. This structure is a stone masonry dam with an overflow section notched in the dam. The structure impounds water and forms an intake reservoir for the Westfield Water Department. During the flood of August, 1955, damage was done at the dam, but not directly to the dam. Downstream of the dam, washouts occurred in the valley both on the sides of the valley and in the bottom of the valley. Flood waters passed over the entire length of the dam and did some damage to natural ground situated at the left end of the dam. Ledge at this point prevented any damage occurring to the dam. All flood damage has been repaired at this structure, and when last inspected, the dam was in very good condition.

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K. Foster Machine Co. Dam

→ This is a wooden dam located on Little River at a point just upstream from the Foster Machine Co. plant. The structure is very low and does not impound a great quantity of water. It has a spillway section extending the full width of Little River. During the flood of August, 1955, the only damage noted at this structure was the loss of some planking on the apron immediately downstream from the dam proper. When last inspected, the dam itself was found to be in relatively good condition. The apron still requires repairs to planking. It would seem advisable to replace broken and missing planks on the apron in the very near future in order to prevent more expensive maintenance being required at a later date. It is recommended that the condition of the broken and missing planking on the apron be called to the attention of the owner.

L. A. H. Wilgus Dam

This is an earth and log timber crib structure located on Ashley Brook at a point westerly of College Highway and just upstream from Hillside Road. The dam was built not too many years ago for the purpose of providing a swimming area for public use. In the flood of August, 1955, a portion of the earth embankment was completely washed thru. The timber crib overflow section did not appear to be damaged by the flood water. The breach thru the earth embankment was large enough to prevent the ponding of any water and provided a free passage for the water of Ashley Brook. The owner has never repaired this dam but has built a new pool at the site of the old pond by diking off a portion of the basin and introducing water into the basin from a pipeline leading from Ashley Brook. Thus, Ashley Brook does not flow thru the present swimming pool but bypasses the pool and the pool is fed by a pipeline. As now existing, this structure does not come under County jurisdiction. The site of the Wilgus dam is examined from time to time to be certain that a free waterway exists thru the breach and that no pond will be formed by the damaged dam.

M. Stevens Paper Co. Lower Dam

This is a masonry dam located on Little River at the site of the lower Stevens Paper Mill just upstream from College Highway. The spillway of the dam extends across the entire width of Little River. During the flood of August, 1955, the entire left abutment area of the dam was washed thru. This area constituted the backyard of the mill. The natural ground as well as the embankment of the abutment was completely washed away and damage occurred to the mill building. The dam itself remained undamaged by the flood water. Immediately following the flood the dam was altered and the abutment area repaired. The crest of the dam was lowered to provide a greater capacity for the passage of flood waters without allowing the water to rise high enough to flood the abutment area in the future. The

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Jan. 30, 1957

entire abutment area was replaced and when last inspected, the dam was found to be in excellent condition. The pond now formed by the lowered dam is very shallow and only a small quantity of water is stored behind the structure.

N. Stevens Paper Co. Upper Dam

This structure is located upstream of the dam last described at a point on Little River where Granville Road crosses the stream and just downstream from Horton's Bridge. The dam is a masonry structure and extends across Little River with a spillway crest the entire width of the valley. This dam, as in the case of the dam previously described, is used in connection with the Stevens Paper Mill located at the dam. During the flood of August, 1955, no damage of consequence occurred at this dam. Flood water washed over the abutment areas of the dam and washed earth from around and behind the right abutment. The right abutment area is solid ledge and, consequently, only the shallow covering of earth on the ledge and the hardpan was removed. For all practical purposes no damage was done to the structure in the flood. When last inspected, this dam was found to be in very good condition.

O. Logie Dam, now Curtis Lane

This is a very shallow masonry dam located on Munn Brook just westerly of Loomis Road. The dam formed a very shallow and small pool for private swimming and recreational purposes. It was located directly behind the house of the owner. During the flood of August, 1955, the entire shallow structure was washed away. Immediately following the flood there was no evidence of the dam except some masonry at the left abutment. When last inspected, the site of the dam remained unchanged and hardly a trace of any structure was visible.

P. Girl Scout Dam

This is a dam formed with stop planks placed across the Munn Brook. The site of the dam is westerly of Loomis Road and downstream of the dam previously described. The stop planks are placed between supports and a shallow pool is formed for the purpose of recreational use by girl scouts using the adjacent camp area. In the flood of August, 1955, about 6 ft. of water was flowing at the dam site and the water washed around the end of the structure doing damage to the natural ground. When last inspected, the conditions at this structure had not changed materially except that the end where the washout had occurred was repaired with local fill. Since the water formed by this stop plank dam is only approximately 2 ft. in depth above the normal level of the brook, little or no danger exists as a result of this dam. Hardly any water is ponded and considering all factors in the case, the dam seems satisfactory at the present time.

Q. Springfield Water Works Intake Dam

This is a large masonry structure located in the gorge on Little River and is actually situated in the southeasterly corner of Russell just westerly of the Westfield line. This dam forms an intake reservoir to provide water for the filtration works of the Springfield Water Dept. situated to the east in Westfield. In the flood of August, 1955, no damage of consequence occurred at this structure, and when last inspected, the dam was found to be in good condition.

R. Springfield Water Works West Parish Filter Dam #1

This is an earth and masonry dam impounding water at the West Parish filters of the Springfield Water Works located just northerly of Granville Rd. in the valley of Cook's Brook. This is the lowest level dam in the series of three dams at the West Parish filters. No damage occurred to this structure in the flood of August, 1955. When last inspected, this dam was found to be in satisfactory condition.

S. Springfield Water Works West Parish Filter Dam #2

This is the middle of the series of three dams at West Paaish filters. It is an earth and masonry structure used in connection with the treatment of water at the Springfield Water Treatment Plant. In the flood of August, 1955, the dam was topped by about 6" of water, but only the toe of the structure was damaged in various places. This damage was immediately repaired and when last inspected, the dam was found to be in very good condition.

T. Springfield Water Works West Parish Filter Dam #3

This is an earth and masonry dam which forms a large storage reservoir in connection with the operation of the water filtration plant. No damage was done at this dam as a result of the flood water of 1955. When last inspected, this dam and spillway with all of its related features, were found to be in very good condition.

U. Cook Dam

This is a relatively low but rather long earth dam situated westerly of Cook's Brook at a point just upstream from Northwest Road. The dam is actually on a small spring-fed feeder brook that joins Cook's Brook near Northwest Road. The dam was built for private recreational use. No damage of any consequence occurred at this dam during the flood of August, 1955. The drainage area above the dam is insignificant and a swale spillway constructed at the end of the dam provided ample capacity for the passage of the flood water. When last inspected, this dam was found to be in good condition.

C.D.
Jan. 30, 1957

V. Gilett Dam, now Stanley Home Products Dam

This is a small earth structure located on property of Stanley Park, just northerly of Horton's Bridge. The dam is used in connection with the Park and is very small and forms a very shallow pond. The structure has an insignificant drainage area and because of the small quantity of water stored and the shallow height of the dam, the structure does not come under County jurisdiction. However, the dam is inspected annually to be certain that it is not raised to a point where it would come under County control. No major damage of consequence occurred at this structure as a result of the flood of August, 1955. When last inspected, the dam was found to be in the usual condition as noted at each inspection during the past years. For all practical purposes, the structure is satisfactory in its condition.

There are twenty-three dams and water impounding structures in Westfield taking into consideration the Park Department dike indicated as "C" above. Of this number, six have been washed out or around by the flood of 1955 and remain unrepaired as of 1956. Major repairs were completed at two dams--Chapin Dam and the Lower Stevens Paper Mill Dam--while minor repairs are either needed or have been done at other structures as indicated herein-above.

Respectfully submitted,



George H. McDonnell
County Hydraulic Engineer

GHM/f

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, Inc.
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PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

CD Westfield

Nov. 20, 1957

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections carried on in the City of Westfield during this year resulted in all dams in that City having been examined at least once. The following is a report on the condition of the various dams situated in the City of Westfield.

A. Horse Pond Dam, Westfield Dept. of Public Works

This is the outlet of Hampton Ponds. Conditions at the dam and spillway are the same as have existed during the past years. It was noted that the level of the stored water was quite low on the day of the last inspection, Nov. 11, 1957. One stop log was in place in the spillway notch. The top of the stop log was approximately at the same grade as the stone shelf in the spillway. Conditions at this dam were found to be satisfactory.

B. Chapin Pond Dam

This dam was reconstructed in 1956 as a flood repair project. The dam is in very good condition. It was noted that some settlement has occurred in the roadway embankment just westerly of the manhole structure. A close examination of the toe of the dam and along the face of the embankment showed no movement of embankment materials. Apparently, the settlement that has occurred is not of a serious nature. Conditions at this dam were found to be satisfactory.

C. Westfield Park Department Upper Dam

This structure still remains breached as a result of the August, 1955 flood. The breach is wide and provides sufficient area for free flow for flood runoff. Conditions are thus satisfactory.

D. Westfield Park Dept. Canal Wall and Outlet Structure at Southerly End of Park

These structures no longer impound water and in part have been eliminated. Inspection of these structures is no longer necessary unless reconstruction is done.

E. Westfield Park Dept. Lower Dam (Sandy Mill Brook Dam)

This stony masonry structure situated in the narrow and relatively deep portion of the Valley of Sandy Mill Brook at a point approximately 2,000 ft. downstream from the dam described in "C" hereinabove, is in the same general condition as noted in past years. The pond behind the dam is almost entirely filled with deposits of sand and gravel. No water is stored at this structure. The stone masonry work, though a bit dilapidated, is relatively strong and satisfactory. This dam does not present any danger to persons and property downstream, and thus is satisfactory for the present.

F. Boy Scout Dam

This structure is an earth and masonry dam that is relatively high but impounds a small volume of water on a tributary to Great Brook in the southeasterly portion of Westfield. In the flood of August, 1955, a portion of the earth embankment was washed out. A part of the spillway foundation was also washed out. When last inspected, it was noted that the dam had not been repaired. This dam should be either repaired or properly breached and abandoned. At the present time, the drainpipe is open and no pond is formed. However, the drain is not sufficiently large to pass storm flows and it is possible that the pond could become filled at time of heavy runoff. It is recommended that the owner of this dam be advised to either repair the dam or to breach the structure so that no water can be ponded in time of high runoff.

G. Socony Dam

No water is stored behind this structure and free flow is provided for storm runoff. Conditions at the site of the dam are satisfactory.

H. Westfield Sportsmen's Club Dam

This structure still remains breached as a result of the flood of August, 1955. The breach is wide and free. Consequently, no storage of water will occur in time of storm runoff. Conditions at this dam are satisfactory.

I. Zombic Dam

This structure was completely washed out in the flood of August, 1955, and no reconstruction has taken place.

J. Tekoa Dam of the Westfield Water Dept.

This dam was found to be in very good condition.

K. Foster Machine Co. Dam

This is a wooden dam located on Little River at a point just upstream from the Foster Machine Co. Plant. This structure is very low and does not impound a great quantity of water. There are a number of missing planks that should be replaced on the apron of this dam. A small leak was noted at the left abutment. This could be in connection with relief piping that was installed some years ago. It is recommended that the owner be notified of these two conditions.

L. A. H. Wilgus Dam

This structure was breached in the flood of August, 1955 and the breach still exists. Conditions are such that no water is stored behind this dam. The area of the breach is sufficiently large to allow for the passage of flood flows. Consequently, conditions at this dam are satisfactory at the present time.

M. Stevens Paper Co. Lower Dam

This dam is in excellent condition.

N. Stevens Paper Co. Upper Dam

This dam was found to be in good condition

O. Logie Dam (now Curtis Lane Dam)

This structure was completely washed out in the flood of August, 1955. When last inspected, the structure has not been replaced and a free waterway exists at its site.

P. Girl Scout Dam

This is a dam formed with stop planks placed across Munn Brook. It is located a short way downstream from the site of the former Curtis Lane Dam. The stop plank was found to be in fairly good condition. The left abutment of the dam is in very poor condition. However, the depth of water stored at this dam is only 2 feet. The dam presents no danger to persons and property downstream nor is the poor condition of the left abutment cause for concern. Consequently, the dam is satisfactory.

Q. Springfield Water Works Intake Dam

This dam was found to be in good condition.

R. Springfield Water Works West Parish Filter Dam #1 (Lower)

This dam was found to be in good condition.

S. Springfield Water Works West Parish Filter Dam #2 (Middle)

Conditions at this dam were found to be satisfactory.

T. Springfield Water Works West Parish Filter Dam #3 (Upper)

Conditions at this dam were found to be satisfactory.


U. Cook Dam

This dam was found to be in relatively good condition.

V. Stanley Products Dam (Formerly Gilett)

This dam was found to be in satisfactory condition.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

WATER SUPPLY
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STRUCTURAL ENGINEERING
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DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

CD Westfield
Sept. 25, 1958

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections carried on throughout the City of Westfield during this year have now resulted in all dams in Westfield having been examined at least once. The following is a report on the conditions of the various dams situated in the City of Westfield.

A. Horse Pond Dam, Westfield Dept. of Public Works

This is the outlet of Hampton Ponds. Conditions noted at the dam and spillway this past year are in general, the same as those conditions that have existed previously. It was noted that the level of stored water was at about the top of the stop log when the dam was last inspected on Sept. 23, 1958. One stop log was in the spillway notch and the top of the stop log was about level with the stone shelf of the spillway. Conditions at the dam were found to be satisfactory.

B. Chapin Pond Dam, Westfield Dept. of Public Works

In general, this dam is in very good condition. The settlement noted at the embankment adjacent to the manhole structure is about the same as noted in 1957. A close examination of the toe of the dam and the face of the embankment showed no movement of the embankment fill. The manhole cover was opened and the manhole interior examined. A small amount of seepage occurs thru the manhole wall but this is negligible. The shape of the wall is satisfactory. The spillway was found to be relatively free of debris and a good flow of water was passing thru the spillway channel.

C. Westfield Park Department Upper Dam

This dam still remains breached around the right side of the spillway. The breach is wide and free and allows for the safe passage of the stream without ponding water.

D. Westfield Park Dept. Lower Dam (Sandy Mill Brook Dam)

This dam is in the same general condition as reported in previous years. The head of water at the dam is low and hardly any water is stored. The pond area has been completely filled in with silt, sand and gravel. The masonry work is somewhat dilapidated and a breach has taken place at a relatively high elevation behind and around the left abutment. However, the dam as existing does not present any danger to persons and property downstream and thus, is considered satisfactory for the present time by the undersigned.

E. Boy Scout Dam

When last inspected, no action had been taken by the owner to properly repair or breach the structure. A recommendation regarding breaching of this structure was made thru your Board during the later part of this past summer. An explanation was included in the letter to the owner regarding the danger of leaving the dam as it has existed since the flood of August, 1955. The dam will be checked periodically to see if the owner does follow the recommendation regarding breaching of this dam.

F. Socony Dam

No water is stored behind this structure and free flow is provided for storm runoff. Conditions at the site of the dam are satisfactory.

G. Westfield Sportsmen's Club Dam

This dam is still breached and a wide waterway is provided for the passage of brook flows. The breach is sufficiently wide to pass extreme high water. No storage of water will occur at this location and consequently, conditions are satisfactory for the time being.

H. Zombic Dam

This structure was a very small privately owned dam that formed a wading and swimming pool just behind the Zombic home. The narrow valley, in which the dam was located, was changed considerably by the rushing flood waters of the flood of August, 1955, and the small dam was completely wiped out. No reconstruction has taken place and it does not appear as if the owner will take any action.

I. Tekoa Dam of the Westfield Water Dept.

This dam was found to be in very good condition.

J. Foster Machine Co. Dam

There are planks missing from the apron of this timber crib structure. These should be replaced in the near future. Some leakage still occurs under the left abutment but this does not appear serious and has occurred for some time. The pond behind the dam is nearly all filled with sand and silt. Consequently, very little water is stored above this dam.

K. A. H. Wilgus Dam

Conditions at this dam are the same as reported a year ago. The breach that was caused by the flood of August, 1955 to the left of the spillway still exists. Debris in this breach should be cleared so that a free waterway will exist to allow for the passage of storm flows. It is recommended that the owner be notified of this condition.

L. Stevens Paper Co. Lower Dam

This dam and the dike constructed behind the left abutment is in excellent condition.

M. Stevens Paper Co. Upper Dam

This structure was found to be in excellent condition.

N. Logie Dam (Curtis Lane Dam)

This was a small structure completely demolished by the flood of August, 1955. No dam has been built to replace the structure washed away by the flood and a free waterway exists at the site.

O. Girl Scout Dam

This dam is formed by stop planks placed across Munn Brook and held in place by vertical steel members forming guides for the planks. The dam is located a short distance downstream from the site of the former Curtis Lane Dam. Stop planks at the Girl Scout Dam were found to be in relatively good condition. However, abutment areas are sandy and though a plank core has been provided, flood water could top the abutment areas and cause a washout around the dam. This could occur more readily at the left abutment.

Since very little water is stored at this dam and since the height of the stop planks is only 2 ft., the structure as existing with its granular and weak abutments is not dangerous to persons and property downstream. Consequently, the dam is considered satisfactory by the undersigned for the present.

P. Springfield Water Works Intake Dam

This dam was found to be satisfactory.

Q. Springfield Water Works West Parish Filter Dam #1 (Lower)

This dam was found to be in satisfactory condition.

R. Springfield Water Works West Parish Filter Dam #2 (Middle)

Conditions at this dam were found to be satisfactory.

S. Springfield Water Works West Parish Filter Dam #3 (Upper)

Conditions at this dam were found to be satisfactory.


T. Cook Dam

Conditions at this dam were found to be satisfactory. One small Burrow hole was noted on the upstream face of the earth embankment near the high portion of the dam. This hole was pointed out to Mrs. Cook. She indicated that the hole was to be plugged within the next few days.

U. Stanley Products Dam (Formerly Gilett)

Conditions at this dam were found to be satisfactory. Very little water is stored and the height of the structure is negligible compared to the width of the embankment.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
Nov. 30, 1959

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections carried on throughout the City of Westfield during 1959 have now resulted in all of the dams within Westfield having been examined at least once. The following is a report on the condition of the various dams situated in the City of Westfield.

A. Horse Pond Dam, Westfield Dept. of Public Works

This is the outlet of Hampden Ponds. The dam and the spillway were found to be in satisfactory condition. Both are in the same general condition as noted in previous years. One stop log was found to be in place in the spillway notch and the elevation of the top of the stop log is at about the stone shelf in the spillway wall. The left abutment area and dam embankment have been cleared of growth and the surface of the earth graded with power equipment. Conditions are satisfactory.

B. Chapin Pond Dam, Westfield Dept. of Public Works

The spillway at this dam was found to be in satisfactory condition and clear of all debris. The embankment is well shaped and settlement noted previously adjacent to the manhole in the roadway is no greater than in the past. Seepage at the downstream toe is normal. The embankment is in satisfactory condition.

C. Westfield Park Department Upper Dam

This structure is still breached at the right of the spillway as the result of the flood of August, 1955. No pond is formed and the breach is wide enough to pass flood flows without ponding water.

D. Westfield Park Dept. Lower Dam (Sandy Mill Brook Dam)

This dam is in the same general condition as reported in previous years. The height of the dam is low and the volume of the pond has been completely filled in with sand and gravel. No water is stored behind the dam and the structure now simply forms a waterfall in the brook. The dam is in general, dilapidated but it does not endanger persons and property downstream.

E. Boy Scout Dam

When last inspected on November 16, 1959, it was noted that this structure was still in the same condition that has existed since the flood of August, 1955. Earth fill has been washed from the embankment exposing a concrete core wall and removing earth support from the downstream face. The spillway chute has been undermined and is in part suspended in air instead of resting on a suitable foundation as needed. The pond was full to the spillway level on the date of this last inspection and water was overflowing thru the undermined spillway. In the past, a communication from the Boy Scout Headquarters indicated that an inspection made after a storm causing heavy runoff showed a negligible quantity of water in the pond. Apparently the drainpipe is now plugged for the flow of the brook has filled the pond.

Failure of the dam will not release a great quantity of water since the pond area is small and thus, danger to persons and property downstream is negligible. However, any children in the immediate area of the structure might be seriously injured should the spillway fail or the core wall collapse as the result of the dam impounding water to spillway level. Since this dam is over 10 ft. in height above the bed of the brook at the spillway and thus comes under Chapter 253 of the General Laws of the Commonwealth, the owner should either properly repair the dam or breach the structure in such a way that it will eliminate any danger of accidents to persons that might occur should the spillway collapse or the core wall fail.

F. Socony Dam

No water is stored behind this structure. The breach is wide and free flow conditions exist for the passage of brook water.

G. Westfield Sportsmen's Club Dam

The embankment at this dam was found to be in good condition. One small gulley on the downstream face of the embankment has been formed as the result of surface runoff. This gulley does not require immediate maintenance nor is it of a serious nature. The spillway is in good condition and both of the bar racks swing freely and are clean of any debris.

Seepage at the toe of the embankment is about normal.

H. Zombic Dam

This dam has been breached since the flood of August, 1955. In fact, the entire dam was destroyed. It was only a very small earth structure forming a shallow, privately owned wading pool. There does not appear to be any indication that the dam will be rebuilt and no further inspections will be needed at this site.

I. Tekoa Dam of the Westfield Water Dept.

This dam and spillway were found to be in excellent condition.

J. Foster Machine Co. Dam

This old timber crib dam is in fair condition. The crest has a good grade and a straight alignment. Some planks and timbers are missing but they do not endanger the structure itself. Small leakage at the left abutment still exists but the quantity of leakage seems somewhat reduced in quantity from that noted in previous years. The pond behind the dam is very shallow having been silted up to nearly the dam crest grade. Thus, only a small quantity of water is in storage.

The canal headworks are in satisfactory condition.

K. A. H. Wilgus Dam

This structure is still breached at the left of the spillway as the result of the flood of August, 1955 and no pond is formed. Debris previously reported in the breach has all been removed and the breach is wide and clear to allow for the passage of flood flows. The small swimming pond upstream of the dam is an artificial pool fed from a pipe.

L. Stevens Paper Co. Lower Dam

The dam and dike are in excellent condition. The right abutment shows some sign of rock erosion that will be checked from time to time. As of now, both abutments are in satisfactory condition.

M. Stevens Paper Co. Upper Dam

The dam is in good condition. The left abutment is also in good condition. At the right abutment there will be need for some protective work, in the near future, at the downstream face of the stone masonry where erosion has now worn away the natural soil. Erosion has caused loss of soil from behind the abutment masonry at its downstream end.

N. Logie Dam (Curtis Lane Dam)

No dam now exists at this site and there is no indication that a dam will be constructed. Consequently, no further inspections seem necessary.

O. Girl Scout Dam

This dam is now apparently owned by R. N. Gaylord. The dam consists of vertical steel members extending up from the bed of the brook and these members form guides to receive stop planks. At the time of the last inspection most of the stop planks had been removed and the brook flowed freely thru the site of the dam. The left abutment area has been washed thru and a wide breach exists in the natural earth. A proper abutment should be built at this point if the dam is to be reactivated. Plans and specifications of the proposed construction should be filed for review and approval.

The right abutment area has had stop logs permanently placed and held in place with earth fill and concreted riprap. This right abutment is poorly designed and built.

P. Springfield Water Works Intake Dam

This dam was found to be in good condition. The downstream face is showing some signs of weathering and minor cracking. No maintenance or repairs are needed as yet.

Q. Springfield Water Works West Parish Filter Dam #1 (Lower)

This dam was found to be in satisfactory condition.

R. Springfield Water Works West Parish Filter Dam #2 (Middle)

Conditions at this dam were found to be satisfactory.

S. Springfield Water Works West Parish Filter Dam #3 (Upper)

Conditions at this dam were found to be satisfactory.

T. Cook Dam

The embankment and spillway at this dam were found to be in satisfactory condition. The swale spillway at the left end of the dam embankment was found to be fairly clean and in good operating condition.

U. Stanley Products Dam (Formerly Gilett)


This dam was found to be in satisfactory condition. Very little water was in storage at the time of the last inspection. Much of the earth embankment

was exposed and it was found to be well shaped and of suitable cross-section.

V. Florek Dam

The site of this proposed dam was inspected but it was found that no construction had as yet been started. It is my understanding that the owner plans to file new plans and specifications of the structure to allow for a change in materials to be used for spillway tube construction.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

Recd Nov. 25, 1960

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
Nov. 22, 1960

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections carried on throughout the City of Westfield during this year have now resulted in all dams within Westfield having been examined at least once. The following is a report on the condition of the various dams situated within the City of Westfield.

A. Horse Pond Dam, Westfield Dept. of Public Works

This dam and spillway is at the outlet of Hampton Ponds. The dam and spillway were both found to be in satisfactory condition. Conditions were in general the same as noted in 1959. One board was found in the spillway notch with the overflow level just below the grade of the masonry ledge in the spillway opening. The embankment is in good condition and is clear of brush. A fence has been built across the dam, just to the east of the spillway notch. The fence has apparently been built to prevent persons crossing from the westerly to the easterly side of the dam embankment.

B. Chapin Pond Dam, Westfield Dept. of Public Works

The embankment at this dam is well shaped and is clear of brush. Seepage at the toe of the dam is about normal. Riprap on the water side face of the dam is in good condition. The spillway chute was found to be clear and a good flow was passing thru the channel. In the near future, the City should give consideration to the removal of large trees growing from the dam embankment. This matter will be discussed with the City Engineer in the near future. The depression in the embankment at the valve chamber is about the same as in previous years. No further settlement of the embankment has taken place.

C. Westfield Park Dept. Upper Dam

This dam is still breached as a result of the flood of August, 1955. The breach is wide and deep. It is capable of passing flood flows without storing any appreciable quantity of water.

D. Westfield Park Dept. Lower Dam (Sandy Mill Brook Dam)

This dam was found to be in the same condition as reported in previous years. The masonry of the structure is dilapidated but the dam is not in danger of being washed out. The pond area behind the dam is filled in completely with sand and gravel. Thus, no water is stored. The dam now simply acts as a waterfall in the stream. Conditions are considered satisfactory.

E. Boy Scout Dam

This dam is still in the same condition as previously reported despite the fact the structure was to have been breached to prevent the ponding of water. At the time of the last inspection on November 2, 1960, the drain was partly plugged and water level in the pond back of the dam was at spillway grade. Water was flowing thru the spillway and debris partly blocked the spillway opening.

Earth fill has been washed from the embankment in the flood of Aug., 1955 exposing a concrete core wall and removing earth support from the downstream face. The spillway chute has been undermined and is in part, suspended in air instead of resting on a suitable foundation as needed.

Failure of this dam will not release a great quantity of water since the pond area is small and thus, danger to persons and property downstream is negligible. However, any children in the immediate area of the structure could be seriously injured should the spillway fail or the core wall collapse as the result of the dam impounding water to spillway level. Since the height of the dam is well over 10 ft. above the bed of the brook, the structure does come under Chapter 253 of the General Laws of the Commonwealth. The Owner should either properly repair the dam or the structure should be breached and done away with to eliminate any danger of accidents to persons that could occur should the spillway structure collapse or the core wall fail.

It is recommended that your Board again call to the attention of the Officials of the Boy Scouts that the dam, as existing, is a liability and could be the cause of injury or even loss of life of an individual.

F. Socony Dam

This dam has been breached for many years. The breach is wide and deep. Free flow conditions exist to allow for the passage of brook water without the formation of any pond.

G. Westfield Sportsmen's Club Dam

The embankment and spillway are in very good condition. The small gulley in the embankment reported a year ago has been filled with stone and erosion at this gulley controlled. The spillway bar racks swing freely to allow for automatic opening, should they become plugged with debris, leaves, etc.

The top of the embankment has been dressed with stone chips and well graded. Riprap paving is being laid on the embankment at the downstream side adjacent to both spillway abutments. Maintenance at this dam is good.

H. Zombic Dam

As reported a year ago, the dam was entirely destroyed in the flood of August, 1955. It was only a very small earth structure forming a shallow privately owned wading pool. In last year's report, the undersigned pointed out that there appeared to be no further need for inspections at the site of this washed out dam. One inspection was made during 1960 and conditions still remain the same. It is doubtful if the Owner will ever rebuild and no further inspections will be made.

I. Tekoa Dam of the Westfield Water Dept.

This dam was found to be in excellent condition.

J. Foster Machine Co. Dam

The timber crib dam is in fairly good shape. The grade of the crest is good and the alignment is relatively straight. A few timbers are missing from the structure but they are not of major importance. Leakage under the left abutment is about the same as noted in preceding years. This leakage does not endanger the structure in any way. The right abutment is in satisfactory condition. The pond behind the dam is very shallow and is rapidly filling in with deposits carried by the stream .

The canal headworks were found to be in satisfactory condition.

K. A. H. Wilgus Dam

This dam is still breached as a result of the flood of August, 1955. The breach is wide and deep enough to pass flood flows. The pool now in use is not on the stream itself but off to the side and is pipe fed. Consequently, the structure as now existing does not come under County jurisdiction.

L. Stevens Paper Co. Lower Dam

The embankment at this dam was found to be in satisfactory condition. There was some indication of weather wear at the edge of the turf on the upstream side of the top of the dike at the left abutment. However, the condition was not serious as of the last inspection. This condition will be noted during the coming year and any needed corrective action recommended. The spillway and both abutments were in satisfactory condition.

M. Stevens Paper Co. Upper Dam

This dam was found to be in very good condition at the time of the last inspection. Repairs have been made with riprap at the right abutment. The repairs have been well done.

N. Girl Scout Dam (Now Gaylord)

This dam is in the same general condition as reported a year ago. The left abutment area is washed out. Some stop logs are still in place within the limits of the bed of the stream. Stop logs in the central section of the dam have been removed to allow for passage of the flow of the stream. If the dam is to be maintained as an active structure, it should be repaired, and placed in good condition in accordance with plans and specifications filed with your Board.

O. Springfield Water Works Intake Dam

This dam was found to be in very good condition. Weathering at the downstream face as reported previously has grown no worse.

P. Springfield Water Works West Parish Filter Dam #1 (Lower)

Both the dam embankment and spillway are in excellent condition.

Q. Springfield Water Works West Parish Filter Dam #2 (Middle)

Both the dam embankment and spillway are in excellent condition.

R. Springfield Water Works West Parish Filter Dam #3 (Upper)

This dam was found to be in satisfactory condition. The spillway was in good condition. There was some evidence that maintenance may be needed on the face of the earth embankment in the coming year. This condition will be checked in 1961 and if treatment of the sod is desirable, a recommendation in relation thereto will be submitted.

S. Cook Dam (Now Howard Smith of Smith Monument Co.)

The embankment was found to be in good condition. It is well shaped and has a good growth of sod. The tube spillway thru the dam is in satisfactory condition. All but one stop log was found to have been removed from the spillway inlet and thus the pond was almost empty at the time of the last inspection on November 8, 1960. The swale spillway to the left of the embankment was found to be in satisfactory condition.

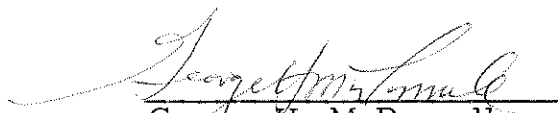
T. Stanley Products Dam (Formerly Gilett)

The embankment at this small dam was found to be in good condition. Some debris was noted at the spillway entrance and it was removed. On the whole, this small structure was in good condition.

U. Florek Dam

No work has been started as yet on this structure. Materials are at the site of the work however, and it can be expected that some work may begin within the next year. It is my understanding that Mr. Florek plans to file new plans and specifications for a structure to allow for a change in the spillway tube details.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
Sept. 14, 1961

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts

Gentlemen:

Inspections carried on recently throughout the City of Westfield have now resulted in all dams within that City having been examined at least once during the year 1961. The following is a report on the condition of the various dams situated within Westfield.

A. Horse Pond Dam - Westfield Dept. of Public Works

This dam was found to be in satisfactory condition. Both the embankment and the spillway were found to be about the same as always noted. One board was noted in the spillway notch with the result that overflow level was just below the grade of the masonry ledge in the spillway opening. As existing, at the time of the last inspection, conditions are satisfactory in all respects.

B. Chapin Pond Dam - Westfield Dept. of Public Works

The embankment at this dam was found to be in satisfactory condition. A recommendation was passed on to the City Engineer that the downstream slope of the embankment should be fertilized for the purpose of promoting a good sod growth. Also, it was recommended that all brush growth should be kept cut down.

It was noted that the bridge abutments carrying the roadway bridge over the spillway are in relatively poor condition and could collapse in time of heavy storm flow or following further weathering and erosion. Such a collapse might cause the bridge and resulting debris to block the spillway in such a way that in time of storm flow, the dam could be overtopped. At the time of the inspection the City Engineer of Westfield was present and these conditions were pointed out to him. He agreed to have these matters cared for.

C. Westfield Park Dept. - Upper Dam

This dam was found to be breached and in the same general condition as noted previously. The structure was breached to the right of the masonry spillway in the flood of Aug. 1955. The breach is wide enough and deep enough to pass flood flows without storing any appreciable quantity of water.

D. Westfield Park Dept. Lower Dam (Sandy Mill Brook Dam)

This dam was in the same general condition as noted and reported in previous years. The dam is nothing more than a water fall in the stream and since the pond bottom has been filled with sand and gravel, due to storm flow, no water is stored behind the dam. Loss of the dam could cause no damage to persons or property downstream.

E. Boy Scout Dam

This dam is still in the same general condition as previously reported in annual reports and special letter reports. At the time of the last inspection on July 27, 1961, it was noted that the pond was at a low level but the drain apparently was partly plugged.

Earth fill was washed from the embankment during the flood of Aug. 1955 exposing the concrete core wall and removing earth support from the downstream face. The spillway chute was undermined at the same time and a portion is now suspended in air instead of being supported on a suitable foundation. This condition has existed year after year. At times in the past, the undersigned has reported water in storage to the spillway level. As pointed out previously, failure of this dam will not release a great quantity of water since the pond area is small and thus, danger to persons and property downstream is not great. However, should a child be playing in the immediate area of this structure when a collapse occurs, that child could be seriously injured or even killed. Because of the possibility of serious liability, should such an accident occur, the Owner of the dam should either properly repair the structure or should breach it and do away with it.

It is recommended that your Board again call to the attention of the officials of the Boy Scouts that the dam, as existing, is not safe, that they have been notified of the condition many times and that these notices are a matter of official record. Injury to any person as the result of the condition at the dam might result in serious consequences depending upon what action would be taken by the injured or their family.

F. Socony Dam

This dam has been breached for many years. The breach is now wide and deep. Little evidence of the old dam remains. The flood of Aug. 1955 and subsequent heavy storms and weathering action have eliminated almost all evidence of the old dam. So little of the structure now remains that future inspections at this site are no longer needed.

G. Westfield Sportsmen's Club Dam

The embankment at this dam was found to be in very good condition. It was noted that broken stone paving was being added to the upstream slope on the left side of the spillway.

At both sides of the spillway, on the embankment side of the wingwalls, downstream face, hand placed riprap has been laid up to form a retaining wall. This has done much to improve the safety of the structure at this location.

The swinging gates were checked and found to be operating freely with the exception of the left gate. A piece of metal in the spillway was blocking full motion of this unit. The metal was removed and discarded.

The spillway masonry was found to be in good condition. Seepage at the toe of the embankment was found to be about normal.

H. Zombic Dam

The site of this small dam was inspected once more to be certain that no work has been done to reconstruct the structure. No evidence of the dam remains and the area is still littered with fallen trees and flood debris as the result of the Aug. 1955 flood. No further inspections will be needed at this site.

I. Tekoa Dam of the Westfield Water Dept.

This dam was found to be in its usual excellent condition. It was noted that the pond was down to about two-thirds of its capacity. There was no evidence of leakage and thus it must be assumed that consumption of water by the City was taking place at a greater rate than the water was being released from the storage reservoir upstream.

In a year or two it may be necessary to kill weed and brush growth beginning to occur from some of the masonry joints. The condition will be noted next year and a recommendation made at that time.

J. Foster Machine Co. Dam

This dam has been entirely removed from Little River. As mentioned in a previous special letter report earlier this year, a portion of the dam settled and collapsed without doing any damage to persons and property downstream. The industry investigated the advisability of repairing the dam or abandoning it. The industry decided to abandon the dam and to obtain water for fire protection purposes from another source.

The entire dam has been removed from the stream and the stream bed cleared and graded. At the time of the last inspection only a few of the timbers remained in a pile, off to the side of the main bed of the stream, and apparently the pile was being prepared for burning. The canal head-works have been abandoned and the canal filled in.

K. A. H. Wilgus Dam

This dam is still breached as the result of the flood of Aug. 1955 and the breach is wide enough and deep enough to pass flood flows. The pond now in use for swimming purposes is not in the bed of the stream but is an artificial pool off to the side and it is pipe fed. Consequently, this structure as now existing does not come under County jurisdiction. Inspections of the site are made annually to be certain that the breach is maintained open for the passage of flood flows.

L. Stevens Paper Co. Lower Dam

This dam was found to be in very good condition. The abutment areas were all maintained. The earth embankment was well shaped and the turf was thick.

M. Stevens Paper Co. Upper Dam

The dam and the abutment areas themselves were found to be in very good condition.

N. Girl Scout Dam (Now Gaylord)

The stop logs were not in place in the central section of this dam. However, a large tree trunk had been carried downstream by the water

and was lodged across the opening between the vertical supports. The log was causing the same general effect as if a stop log was in place. In the side sections of the dam only two stop logs were noted in place. The stream had washed around the left end of the dam and as a result, no pond could be formed. The possibility of this washout at the left abutment had been pointed out in previous reports and had been discussed with the Owner. The Owner, at that time pointed out that he had considered the possibility of a washout and was not concerned over damage to his property since he alone would be involved.

Based upon existing conditions, it would now appear as if the dam will be abandoned for a time, if not permanently, since major work will be required to restore the structure and seal off the flow of water around the left end.

O. Springfield Water Works Intake Dam

This dam was found to be in very good condition. Weathering at the downstream face as reported two years ago has grown no worse.

P. Springfield Water Works West Parish Filter Dam #1 (Lower)

The embankment and spillway, as well as the emergency swale spillway, were found to be in very good condition.

Q. Springfield Water Works West Parish Filter Dam #2 (Middle)

This structure was found to be in good condition. Both the embankment and the spillway are well maintained.

R. Springfield Water Works West Parish Filter Dam #3 (Upper)

The embankment was found to be in good condition, well shaped and no sign of settlement could be noted anywhere. The spillway, though partly covered by vegetation along the length of its channel, was in satisfactory condition.

S. Howard Smith Dam (Formerly Cook Dam)

The dam embankment was found to be in fairly good shape. The Owner was in the process of cutting brush from the embankment at the time of the last inspection. Stop logs were present in the spillway to the top of the masonry structure but the swale spillway at the left end of the dam was open and fairly clear of any brush growth. The dam was satisfactory at the time of the last inspection.

T. Stanley Products Dam (Formerly Gillett)

This dam was found to be in good condition. The embankment was well shaped and sodded. The spillway inlet was clear and clean.

U. Florek Dam

No construction has been started this year and, based on a conference with the Owner, he will not start any construction until next year at the very earliest.

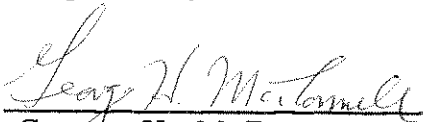
V. Westfield Building & Lumber Co. Dam

A new dam was noted on property of the Westfield Lumber & Building Supplies Co., situated adjacent to Rte 20, just south of the Russell Town-line. The dam is quite low being 4 ft., more or less, in height. It consists of an earth embankment impounding about 1/2 to 2/3 of a million gallons of water. The average depth of the pond probably would not exceed two feet, while the greatest depth just back of the spillway section of the dam is probably not greater than 4 ft. to 5 ft. The drainage area is negligible, probably no greater than one-half square mile.

The spillway is a trough of concrete with flashboards of the stop-log type. The width of the opening at the stop log is about 3'4". The distance from the top of the uppermost stop-log to the top of the masonry spillway is only 1'8". Thus, the spillway is so small that a good Fall rain or heavy runoff in the Springtime will probably exceed the capacity of the structure, overtop the embankment and damage it.

Because of the small size of the dam, the negligible area and the small quantity of water in storage, the structure does not come under County jurisdiction. Since it is adjacent to the main highway and easily accessible for inspection, it will be checked annually to be certain that the Owner does not raise it to a point where storage would exceed one million gallons.

Respectfully submitted



George H. McDonnell
County Hydraulic Engineer

GHM/cmb

GEORGE H. McDONNELL
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TIGHE & BOND CONSULTING ENGINEERS

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
Oct. 4, 1962

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm St.
Springfield, Mass.

Gentlemen:

Inspections carried on during 1962 in the City of Westfield have now resulted in all dams within that community having been examined at least once. The following is a report on the condition of the various dams situated within the City of Westfield.

A. Horse Pond Dam, Westfield Dept. of Public Works

Both the dam and the spillway were found to be in satisfactory condition. Horse Pond Dam is at the outlet of Hampton Ponds. The embankment was found to be reasonably well covered with sod. Spillway masonry was in good condition. The usual single stoplog was in the spillway notch at the normal elevation wherein the top of the log was just below the stone ledge.

B. Chapin Pond Dam, Westfield Dept. of Public Works

The embankment of the dam needs brushing on the downstream side. Spillway bridge abutments are in poor condition. A high rate of discharge thru the spillway might cause further damage to the abutments and collapse of the bridge. Consideration should be given to improving these abutments in the near future. If new abutments are built, the distance between these abutments should be widened.

C. Westfield Park Dept. Upper Dam

This dam is still breached as a result of the flood of August, 1955. The breach is wide and deep. It is capable of passing flood flows without storing any appreciable quantity of water.

D. Westfield Park Dept. Lower Dam (Sandy Mill Brook Dam)

This dam is in the same general condition as noted previously. No water is stored since the entire pond volume is filled with silt and gravel. Though the stone masonry spillway is dilapidated, and the abutment areas in poor condition, the structure is not dangerous to persons and property downstream. The dam acts simply as a waterfall in the brook.

E. Boy Scout Dam

This dam has been properly breached by cutting an opening in the masonry wall and through the earth embankment at the upper level of the structure. Recommendations had been made in the past that the dam either be abandoned or properly repaired. As now breached, no water will be stored in the pond. The breach is wide enough and deep enough to pass flood flows. Earth excavated from cutting through the small embankment has been piled against the old spillway structure to plug the cavity underneath. As existing, the structure will not hold water and thus is no longer considered a dam.

F. Socony Dam

This dam has been breached for many years and hardly any evidence of the old structure remains. Inspections are no longer needed and annual reports will not be made on this dam in the future.

G. Westfield Sportsmen's Club Dam

The embankment of the dam and the broken stone paving on the upstream surface were found to be in very good condition. The spillway structure was well maintained and the metal grates pivoted above the spillway swung freely. The toe of the dam, though wet from low rate seepage was in about the same condition as noted in previous years. The dam in general was considered to be in very good condition.

H. Tekoa Dam of the Westfield Water Dept.

This dam was found to be in satisfactory condition. The masonry and abutment areas were OK. Some vegetation is beginning to grow from a number of masonry joints. This growth is not large

enough to cause damage to the joints. It will be watched in the future and any necessary recommendations made for its removal at that time.

I. A. H. Wilgus Dam

This dam is still breached as a result of the flood of August, 1955. The breach is wide and deep enough to pass flood flows. The pool now in use is not on the stream itself but off to the side and is pipe fed. Consequently, the structure as now existing does not come under County jurisdiction.

J. Stevens Paper Co. Lower Dam

This dam was found to be in very good condition. The earth embankment on the left shore of the stone riprap paving was well aligned and properly maintained. At the right abutment conditions were found to be very good.

K. Stevens Paper Co. Upper Dam

This dam was found to be in very good condition. At the right abutment the riprap paving was found to be well aligned and graded. At the left abutment the concrete dike was under construction. This dike is above and behind the abutment. It is being built to prevent debris and ice cakes from damaging the mill building during flood flows.

L. Gaylord Dam

This structure is no longer active. The stoplogs have been removed from the vertical guides in the stream and the sandy abutment at the left of the dam has been washed out. I met the owner at the site during the inspection and he does not plan to reactivate the dam in the near future. No water is stored nor will there be any water stored in time of flood flow.

M. Springfield Water Works Intake Dam

This dam was found to be in very good condition.

N. West Parish Filter Dam #1 (Lower) Springfield Water Works

The embankment of this dam was in very good condition. It has been well brushed, mowed and maintained. The spillway was

clear and operating. The emergency spillway chute was found to be in fair condition and though weed growth is occurring along its length, the weeds are not thick enough to impede emergency storm flow.

O. West Parish Filter Dam #2 (Middle) Springfield Water Works

The embankment of this dam was in very good condition. It has been well maintained and the sod is thick. The spillway was found to be clean and clear.

P. West Parish Filter Dam #3 (Upper) Springfield Water Works

The embankment at this dam was found to be in excellent condition. The emergency overflow spillway at the right end was satisfactory. No work has been started as yet on constructing the new intake at the left end of the dam.

Q. Howard Smith Dam

The downstream side of the embankment is very overgrown with brush and as a result it is difficult to make a thorough inspection. The brush should be cut and its growth discouraged. The swale spillway at the left end of the embankment should be cleared of any vegetation and a good growth of sod promoted. The spillway box was found to be satisfactory, except that a few sticks were noted in the inlet and they should be removed.

R. Stanley Pond Dam

The embankment at this small dam was found to be in very good condition. The drain and spillway were satisfactory.

S. Florek Dam

No work has been started as yet on this new structure. The Springfield Water Works pipeline that will apparently pass just to the north of the proposed dam site will be under construction shortly. A water pipe for this line has been strung out along the site.

T. Pieczarka Realty, Inc., Dam

There is a small dam situated southeasterly of the property formerly occupied by the Westfield Lumber & Building Supplies Co. on Rte. 20. The dam is a borderline case in that under certain

conditions of operation it may hold approximately 1 million gallons. However, the drainage area is negligible and the height of the dam is less than 10 ft. The spillway at the dam is inadequate for the drainage area involved and it is possible that loss of the dam might endanger the highway immediately downstream. Washouts have occurred on each side of the masonry spillway and these have been plugged with stones, bricks and miscellaneous fill. There is a wooden rack in the spillway that could become clogged with debris and cause overtopping of the dam even during a moderate continued storm flow condition.

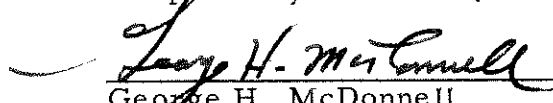
Though the structure is a borderline case, it is recommended the owner be advised that the spillway is inadequate for the drainage area involved.

U. Gogol Dam

This is a small dam built for private recreational and aesthetic purposes to the south of Western Ave. and on the upper end of a small feeder brook to Little River.

The owner requested an inspection of the dam and pond. The undersigned found the structure to be less than 10 ft. in height, to be impounding less than 1 million gallons of water, and to be on a drainage area of a small fraction of a square mile. Thus, the dam does not come under County control.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/f

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
July 24, 1963.

The Hon. the Board of County Commissioners
Hampden County Courthouse
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections carried on during 1963 in the City of Westfield have now resulted in all dams within that community having been examined at least once. The following is a report on the condition of the various dams situated within Westfield.

A. Horse Pond Dam, Westfield Dept. of Public Works

The dam embankment and the spillway were found to be in satisfactory condition. This dam is the outlet of Hampton Ponds. Stoplogs in place within the spillway were at the usual grade, with the top of the upper stoplog being about equal to the elevation of the masonry shelf in the spillway. The masonry of the spillway was in good condition. The earth embankment was reasonably well shaped and clear of any brush growth. Water level in storage was about 8" below the top of the upper stoplogs.

B. Chapin Pond Dam, Westfield Dept. of Public Works

The embankment at this dam needs to be cleared of all brush growth on the downstream side. The brush is so thick that a proper inspection of the embankment cannot be made. Any need for embankment maintenance cannot be readily seen because of the heavy brush growth.

Spillway bridge abutments are in poor condition and in need of replacement. A high rate of discharge thru the spillway could cause further damage to the abutments and the collapse of the bridge. New abutments should be built at this dam within the next year. When

abutments are built, the distance between the new abutments should be made slightly larger than the clear distance now available.

C. Westfield Park Dept. - Upper Dam

This dam is still breached as the result of the flood of August 1955. The breach is wide and deep and is capable of passing flood flows.

D. Westfield Park Dept. - Lower Dam (Sandy Mill Brook Dam)

This structure is in the same general condition as reported in recent years. Little or no water is stored since the entire pond volume and brook valley is filled with sand and gravel to the crest of the masonry spillway. The spillway structure itself, though dilapidated, is relatively sound. The dam, as existing now, simply acts as a waterfall in the brook.

E. Westfield Sportsmen's Club Dam

The embankment of this dam was found to be in very good condition. It was well shaped and well maintained. The spillway structure was clean and clear of any debris and the swinging rack moved freely. The concrete and stone masonry of the spillway is in good condition. This was noted to be in as good a condition as has been noted in recent years.

F. Tekoa Dam - Westfield Water Dept.

The stone masonry of this dam was in good condition. Some small tree and brush growth is taking place from the joints of the block masonry. The growth is not large enough as yet to cause any damage to the masonry joints. However, if the brush growth is still taking place at the time of the inspection in 1964, a recommendation will then be made that the Owner be notified to cut the small tree and brush growth and to kill the root structure.

The drainage chute, just downstream of the masonry portion of the dam, was in good condition. Abutment areas were satisfactory.

G. A. H. Wilgus Dam

This dam is still breached as the result of the flood of August 1955. The breach is wide and deep and can safely pass flood flows. The pool now in use is not on the stream itself but has been built off to the side of this stream and is pipe fed. Consequently, the swimming pool, as existing, does not come under County jurisdiction.

H. Stevens Paper Co. - Lower Dam

The earth embankment and dike at this dam were found to be in excellent condition. The masonry spillway and the abutments are in very good condition. The riprap downstream of the dam at the left bank is stable and OK.

I. Stevens Paper Co. - Upper Dam

The masonry of this dam is in good condition. The abutment areas are also good and well maintained. Erosion of a few years ago at the right bank, downstream of the dam, is well controlled by the riprap that was placed there in the past. The new training wall at the left abutment is in place and is satisfactory. It will prevent any flood flow, as well as debris and ice cakes from damaging the mill building.

J. Gaylord Dam

This dam is no longer active and is in the same general condition as reported last year. Stoplogs have been removed from the vertical guides in the bed of the stream. The flow of the brook passes the side of the dam without any interference whatsoever. No water would be ponded in time of flood flow. The Owner does not plan to reactivate this dam in the future. Inspections will be made during the next year or two and if no changes are made, then a recommendation will be made that the site of this old abandoned dam be dropped from the inspection routine.

K. Springfield Water Works Intake Dam

This dam was found to be in very good condition.

L. West Parish Filter Dam #1 (Lower) Springfield Water Works

The embankment and the tube spillway were found to be in good condition. The swale spillway around the right end of the dam has been brushed and well maintained. The dam was considered safe when checked.

M. West Parish Filter Dam #2 (Middle) Springfield Water Works

The embankment and the spillway structure were found to be in good condition and well maintained.

N. West Parish Filter Dam #3 (Upper) Springfield Water Works

The embankment at this dam was found to be in excellent condition.

Masonry and related chute to the right of the dam embankment were found to be in suitable condition. It was noted that no work has as yet been started on the new pipe intake structure to be built thru the dam embankment. Water level in storage was down about 2 ft. to 3 ft. from normal high water elevation.

O. Howard Smith Dam

The embankment at this dam was well shaped and contains a good growth of sod. The main spillway structure was OK. The swale spillway to the left end of the dam was reasonably well shaped and contained little brush growth.

P. Stanley Park Dam

The embankment at this small dam was in good condition. It is covered with a good, thick growth of sod. The spillway inlet structure was free and clear of debris.

Q. Florek Dam

No work has as yet been started on the construction of this dam.

R. Pieczarka Realty Inc., Dam

Conditions at this dam were about the same as reported in 1962. This structure still does not come under County jurisdiction but is checked each year to make sure it is not enlarged. The embankment is poor and the spillway much too small for the drainage area involved. Evidence at the dam indicates that water overflowed the embankment and the spillway was overloaded at some time during the past year. The Owner has been notified in the past of the dangerous condition of his dam and the fact that it is located immediately above Rte 20 where a culvert carries the discharged water under the State Highway. The Owner of the dam was advised, in writing, about a year ago of the unsatisfactory condition at the dam but has taken no steps to improve the spillway and increase its capacity.

S. Arm Brook Dam

This is the Flood Control Dam being built by the U. S. Soil Conservation Service on Arm Brook just adjacent to the Mass. Turnpike. The embankment has been completed nearly to final grade. Inspections made from time to time indicate that the material being placed in the

embankment is quite wet. Compaction at the upper level of each lift of the embankment has not been too good but, compaction tests taken 3 ft. and deeper into the embankment have always checked out quite well. The material with which the embankment is being constructed is moist and earth moving equipment causes the material to pump and water content keeps it soft. It is only after the material is in place and loaded with upper layers that it consolidates and meets compaction tests. An inspection of many compaction test results have shown that the embankment is satisfactory in spite of the apparently soft surface. The main spillway tube is in place and the spillway shaft has been completed. The flood spillway channel has been roughly shaped and fine grading still remains to be done with the placing of loam and the planting of grass.

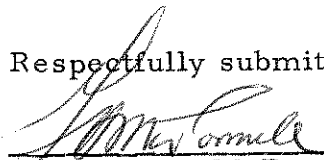
Dike construction will be needed between the dam and the flood flow spillway. This area originally had been planned to be an undisturbed earth barrier but construction operations has disturbed this material so that the natural grade of the ground has apparently changed. The Inspector on the work plans to place compacted impervious material at this location to guarantee that flood flows passing thru the emergency spillway will not come in contact with the embankment of the dam.

Much final grading and cleanup work remains to be done but based upon work completed as of Monday, July 15, all work at this dam will undoubtedly be completed by Fall.

T. Powder Mill Brook Dam

This is a flood control dam being built by the U. S. Soil Conservation Service on Powder Mill Brook. Work on the dam started last year but little was done prior to the Winter shutdown. As of July 15, the area on which the dam is to be built has been cleared and the foundation fill placed. On July 15, the conduit was in place and most of the concrete cradle poured. A portion of the cradle remained to be poured and this section was being formed. Drains were being installed on both sides of the conduit cradle at the downstream end of the construction. The inlet structure had been completed insofar as basic masonry is concerned. The conduit appeared to be in excellent condition and joints well sealed. Concrete cutoff collars were being formed and poured. These collars pass around the entire conduit pipe, as well as under the cradle construction.

Respectfully submitted


George H. McDonnell
County Hydraulic Engineer

GHM/cmb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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TEL. JEFFERSON 3-3991

CD Westfield
July 31, 1964

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Inspections carried on during 1964 at dams in the City of Westfield have now resulted in every dam within that community having been examined at least once. The following is a report on the condition of the various dams situated within Westfield.

A. Horse Pond Dam, Westfield Dept. of Public Works

This dam was in the same general condition as reported in 1963. One stoplog was in the spillway notch. The top of the log was about equal in elevation to the masonry shelf of the spillway structure. Water level in storage was about half-way below the crest of the stoplog. The masonry of the spillway structure was satisfactory and the dam embankment was in good condition. The embankment is fairly clear of brush growth, it has a hard surface and is covered in part with sod. The dam was considered safe and satisfactory when inspected.

B. Chapin Pond Dam, Westfield Dept. of Public Works

The embankment at this dam was found to be in fair condition. However, the stone riprap on the surface of the upstream face, particularly at the top of the dam, is in need of maintenance and repair. Brush on the downstream face of the embankment was not thick and apparently maintenance has been done to keep the growth down. Toe seepage was about normal.

The bridge abutments at the spillway should be improved and the spillway channel kept clear and free of any debris or obstructions.

C. Westfield Park Dept. - Upper Dam

This dam is still breached as the result of the flood of August, 1955. The breach is wide and deep and is capable of passing flood flows.

D. Westfield Park Dept. - Lower Dam (Sandy Mill Brook Dam)

This dam is in the same general condition as reported in previous years. It is nothing more than a low waterfall in the brook. Hardly any water is stored since the brook bed is completely filled with sand and gravel to the spillway crest. The left abutment is becoming more dilapidated. Loss of this dam would not endanger persons and property downstream.

E. Westfield Sportsmen's Club Dam

This dam was found to be in very good condition. The embankment is well maintained and is well shaped. Toe seepage was about normal and the spillway structure was free and clear of any debris. The racks were checked and found to swing freely. The spillway grouted stone masonry is in good condition. Toe seepage thru the masonry at the right downstream toe was noted. The amount of seepage is very small. The wingwalls and abutments at the spillway were found to be satisfactory. Water level in storage was at the crest of the spillway. The dam was considered to be safe when inspected.

F. Tekoa Dam - Westfield Water Dept.

The masonry forming this dam and spillway was found to be in good condition. Small tree growth and vegetation was noted at some of the masonry block joints, particularly just to the left of the spillway notch. This growth should be killed and removed before the roots do damage to the joints of the block construction. Water level in storage on the day of inspection was at the crest of the spillway. The paved chute just downstream and to the left side of the dam was in satisfactory condition.

G. A. H. Wilgus Dam

This dam is still breached as the result of the flood of August, 1955. The breach is wide and deep and can safely pass flood flows. The pool now in use is not on the stream itself but has been built off to the side of this stream and is pipe fed. Consequently, the swimming pool, as existing, does not come under County jurisdiction.

H. Stevens Paper Co. - Lower Dam

The abutments at this dam were in satisfactory condition. Just downstream of the dam itself near the right abutment, there has been some erosion of concrete paving on the exposed ledge of the river bed. However, this condition does not affect the safety of the dam. At the left abutment at about the water line at the crest of the dam, the masonry has become eroded. The condition is not too bad as yet but repairs may be recommended in another year or two.

The masonry of the dam itself is in satisfactory condition. The crest is in good alignment and grade. On the face of the dam about one-third distance from the left abutment a half dozen leaks were noted thru the masonry joints. The leaks were small, do not cause erosion of the dam masonry and their presence do not affect the safety of the structure in any way whatsoever. Leaks of this type are typical in many of the old stone masonry dams.

The earth dike and rock paving were found to be in good condition.

I. Stevens Paper Co. - Upper Dam

The crest of the dam was noted to be in good alignment and on good grade. Cap stones were okay. Both abutment areas were in good condition and the riprap paving on the bank of the stream just below the right abutment was in good condition. The flood training wall at the left abutment was found to be okay.

J. Gaylord Dam

All parts of this old dam have now been removed from the bed of the stream and no evidence of the dam is present at the site except for a small section of the right abutment. Since the stream valley is now free and clear of all portions of the old structure and no water will be ponded at the site during any condition of stream flow, it is recommended that this old dam site be dropped from the inspection routine and from the County records.

During the inspection of 1963, the owner at that time indicated to the undersigned that he did not plan to ever rebuild the dam.

K. Springfield Water Works Intake Dam

This dam was found to be in very good condition.

L. West Parish Filter Dam #1 (Lower) Springfield Water Works

The embankment was in very good condition. The rock face on the wet side was well maintained and the vegetation covering the dry face was in good condition. The spillway tube was satisfactory and an examination of the toe of the dam showed no seepage. The spillway outlet works were okay and the chute spillway around the right of the dam was free and clear of any brush or debris. Water level in storage was at the elevation of the lip of the pipe spillway.

M. West Parish Filter Dam #2 (Middle) Springfield Water Works

The embankment at this dam was in good condition. A good growth of vegetation was found to cover both faces of the structure and the asphalt road on top was well maintained. No toe seepage was noted whatsoever. The concrete of the spillway shaft entrance was in good condition. Some of the stoplogs were out of the slots and water level in storage was somewhat lower than has been noted in the past. In general, the dam was found to be in good condition.

N. West Parish Filter Dam #3 (Upper) Springfield Water Works

The embankment was found to be in excellent condition. A good growth of turf exists on the downstream face and it is kept mowed and properly maintained. No seepage was noted at the toe. The rock paved surface on the reservoir side of the embankment was in good condition. Water level in storage at the time of inspection was about 3 ft. below the spillway crest.

The spillway masonry was in good condition but the chute downstream thereof is becoming overgrown with brush and weeds. The condition is not too bad as yet but if no maintenance work is done within the next year, a recommendation will be made at that time regarding the removal of this growth.

O. Howard Smith Dam

The embankment at this dam is in very good condition. It is well shaped and the top is covered with an excellent growth of sod. The embankment is quite wide for its low height. The swale spillway at the left is in good condition and there is not much weed or brush growth in the channel. The concrete shaft spillway entrance was found to be in good condition, well maintained and clear of debris.

P. Stanley Park Dam

The new spillway at this dam has been nearly completed and the work has been done in accordance with the approved filed plans and specifications. The earth embankment is being further enlarged and improved. The undersigned recommended to personnel at the dam that the new earth embankment material be placed in 8" layers and each layer be thoroughly tamped. The spillway inlet pipe, the outlet pipe, the drain valve and the concrete of the new construction are all in good condition.

The new ponds being built upstream and not coming under County jurisdiction have been nearly completed. The pond at the main dam was empty at the time of inspection.

This dam will be in excellent condition upon completion of the alterations and repairs now being done.

Q. Florek Dam

No work has as yet been started on the construction of this dam.

R. Pieczarka Realty Inc. Dam (Now J. G. Kulper)

Conditions at this dam are about the same as reported last year. In the opinion of the undersigned, the structure still does not come under County jurisdiction but is checked annually to be certain that it is not enlarged to a point whereby it would come under the provisions of Chapter 253 of the General Laws.

The embankment is poorly constructed and the spillway is too small for the drainage area involved. On the day of inspection, water level in storage was at the elevation of the top of the embankment adjacent to the right side of the spillway and water trickled onto and over the top of the embankment particularly adjacent to the outside face of the right spillway wall. A wooden rack has been installed in the spillway opening and this further reduces the spillway capacity to a point wherein storm flows will pass over the existing embankment.

The dam is now apparently owned by a Mr. J. G. Kulper. Since he is probably unaware of the conditions that exist at the dam and the fact that the dam could come under County jurisdiction if enlarged, it is recommended that he be notified of the status of the structure for his information and for any action he cares to take in regard thereto.

As pointed out previously, the dam is located adjacent to State Highway Route 20 and immediately above a culvert that carries the brook water under the State Highway. Should the dam fail in time of storm flow, and the culvert be plugged, damage might be done to the State Highway.

S. Arm Brook Dam

An inspection of this flood control dam was made on Wednesday afternoon July 29 in the presence of Charles Conlin of the U. S. Soil Conservation Service and Mr. Nicholas Roselli, District Supervisor under the same Service.

On the downstream face of the earth embankment where the dam joins the right valley wall, gulleys have been washed in the soil and these should be repaired. Also, gulleys downstream of the dam on the left side of the valley at and below the stilling basin of the pipe spillway should also be filled and repaired.

The grass and turf on the entire dam and in the spillway is only fair to poor. Much of the area should be refertilized and reseeded.

Some gulleys have been filled with gravel and it would seem advisable to loam over the gravel and promote a growth of sod.

The entire dam and flood spillway area should be mowed at an early date. The spillway tube and the inlet structure were found to be okay.

This is a new flood control dam and apparently will be under the maintenance and control of the City of Westfield. There is a recreation pond backed up by the dam and on the day of inspection, there were many people making use of the sandy beach area and swimming in the pond.

An examination of the recreational area indicates that little maintenance is being done since rubbish was noted strewn around and no containers were available for the use of the people in the area. Though this condition does not affect the safety of the dam, it does indicate lack of general attention in the area and would point to the possibility that an overall maintenance program has not as yet been set up and made functional.

In order to keep the dam embankment and the flood flow spillway in good condition, it is essential that erosion be controlled and that a good thick and healthy turf be promoted.

It is recommended that the City of Westfield be notified of the needed maintenance at the dam and spillway, particularly as related to repair of all washed gulleys and the promotion of a good turf cover.

T. Powder Mill Brook Dam

This dam has been recently completed and the entire embankment is in poor condition regarding sod cover. Also, growth on the flood flow spillway, though grassy in various areas, is generally weeds. Many bare spots were noted on both the embankment and in the flood flow spillway.

At the lower end of the dam embankment on the dry side, many small gulleys were noted.

Weeds on the dam and in the flood flow spillway should be cut down before they go to seed and the entire dam embankment as well as the flood flow spillway should be reseeded and fertilized. Much of the surface soil is hard and crusty and will probably need to be loosened up before being seeded.

There is a large gully on the right side of the dam embankment in the upstream slope near the valley wall. This gully should be repaired.

Unless a good sod cover is promoted on the dam and in the flood flow spillway, surface runoff will continue the formation of gulleys and the enlargement of those already started.

A good maintenance program should be set up for this dam following the re-seeding and related work as needed.

U. Milton Berman Dam on Munn Brook

Years ago, prior to the flood of August, 1955, there existed a low curb type of dam at this location, just upstream from the site of the old Gaylord Dam hereinbefore reported under Item J. At the site of this old dam, there now has been built a small loose and porous cobblestone dam across the full width of the stream. This structure raises the water level only about 1 ft. and forms a small pond adjacent to the stream which is used for aesthetic purposes on the Berman property.

In the opinion of the undersigned, this structure is not truly a dam. It impounds very little water, results in a difference in the water level of the brook of only 1 ft. or less and since it is constructed of loose cobblestones,


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any flood flow would spread the stones over the bed of the brook and completely eliminate the whole home-made wall. This structure does not endanger persons and property downstream. It will be inspected from time to time in future years to be certain that it is not enlarged to a point whereby it would be considered a dam and plans and specifications would be needed on file in the County Court House.

Respectfully submitted,



George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
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TIGHE & BOND

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
November 9, 1966

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

All of the dams situated within the City of Westfield have now been inspected at least once during the present calendar year. The following is a report on the conditions noted at each dam situated within Westfield.

A. Horse Pond Dam, Westfield Department of Public Works

The embankment of the dam was in satisfactory condition. There is some brush growing on the slopes of the embankment but this brush growth is not bad enough as yet to require cutting. The stone masonry spillway was found to be okay and one stoplog was in the notch to an elevation of about four inches below the masonry shelf. Water level in storage was the lowest ever noted by the undersigned. The pond has receded a considerable distance from the spillway structure and the dam embankment. In the opinion of the undersigned, the dam was safe when inspected.

B. Chapin Pond Dam, Westfield Department of Public Works

Brush growth on the downstream face of the embankment is quite thick and should be cut down. All debris in the spillway channel should be removed. The abutments supporting the bridge over the spillway channel are in poor condition and should be improved or replaced with good concrete abutments.

Settlement was noted on the top of the dam embankment at the roadway surface adjacent to the manhole at about the center section of the dam. This settlement should be investigated and any defect found should be corrected.

C. Westfield Park Department - Upper Dam

This dam has been breached since the flood of August, 1955 and it is apparent that the dam may never be replaced. Since the breach is deep enough and wide enough to safely pass flood flows, it is recommended that this old dam site be dropped from County records.

D. Westfield Park Department - Lower Dam (Sandy Mill Brook Dam)

This is an old stone masonry dam breached at the left abutment which no longer stores water. The dam itself is only about four feet high and the entire pond volume back of the dam has been filled with sand and gravel washed down from upstream. The dam is nothing more than a small waterfall in the stream.

The dam as existing does not endanger persons and property downstream. It has been in its present condition since the flood of August, 1955 and it is apparent that the structure will not be repaired.

It is recommended that this dam be dropped from the County records.

E. Westfield Sportsmen's Club Dam

This dam was found to be in good condition. The earth embankment was okay. The trap rock surfacing on the top of the embankment and on the upstream slope was in good condition. Some brush growth occurs on the downstream slope but as yet it is not too bad. Toe seepage was normal.

The spillway structure was found to be okay. No debris was on the crest and the swinging screens worked freely. Seepage through the concreted rock filled spillway was negligible. The abutment walls were satisfactory. No flashboards were on the crest of the spillway and water level in storage was at crest elevation. In the opinion of the undersigned, the dam was safe when inspected.

F. Tekoa Dam - Westfield Water Department

Some of the stone masonry joints on the downstream face of the dam underneath the spillway notch need pointing. Vegetation growing from the stone masonry joints should be killed before the root structure damages these joints.

Settlement was noted along the outside face of the small wall paralleling the dam and forming a portion of the chute downstream of the dam and on the left bank of the stream valley. This undermining or settlement, so-called, should be repaired.

The concrete masonry was okay. The spillway notch was satisfactory and free of debris. Water level in storage was down about one foot from the crest of the spillway notch on the day of inspection. Abutment areas and the small earth embankment to the right of the spillway were satisfactory. In the opinion of the undersigned, the dam was safe when inspected but maintenance work recommended hereinbefore should be done by the owner to prevent the need for expensive maintenance at a later date.

G. A. H. Wilgus Dam

This dam is still breached as the result of the flood of August, 1955. The breach is wide and deep and can safely pass flood flows. The pool of water at the site is an artificial pond built in the side of the stream valley and is fed by water conveyed through a pipeline from the brook. Since the pond as existing does not receive the flow of the brook, the structure does not come under County jurisdiction.

The undersigned met Mr. Wilgus at the dam during the inspection and questioned him as to whether or not the breached dam would ever be repaired. He stated that consideration is being given to the repair of the dam and reactivation of the old pond. Mr. Wilgus is aware of the requirement for filing plans and specifications of any proposed construction work. In view of the fact that the dam may be rebuilt, periodic inspections will continue at the site of this breached structure.

H. Stevens Paper Company - Lower Dam

The concrete crest cap was noted to be in good condition and no flashboards were on the crest. Water was flowing over the crest on the day of inspection. It was noted that water still leaks through the face of the stone masonry dam at a few places along the left one-third of the structure and near the bottom of the dam proper. This condition is not serious.

At the right abutment some erosion of concrete was noted at the water flow line just near the downstream edge of the dam crest cap. The

erosion is in the corner of the right abutment. This erosion is not bad enough to require repairs as yet but the condition will be observed in the future and recommendations made regarding repairs if erosion progresses much further.

The stone and concrete masonry forming the left abutment adjacent to the mill was found to be okay. At the top of the embankment near the upstream edge of the earth fill near the woven wire fence, repairs are needed. Also, repairs should be made to the riprap upstream slope of the embankment in the vicinity of the woven wire fence. The remainder of the embankment and upstream slope was found to be satisfactory.

I. Stevens Paper Company - Upper Dam

This dam was found to be okay. 12" flashboards were on the crest. At the left abutment conditions were found to be satisfactory. The concrete training wall built on top of the abutment was in good condition. The crest of the dam has good grade and alignment. The stone masonry of the right abutment was okay. On the day of inspection, water was overflowing the spillway flashboards. In the opinion of the undersigned, the dam was safe when inspected.

J. Springfield Water Works Intake Dam

This dam was found to be in satisfactory condition. The dam was considered safe when checked.

K. West Parish Filter Dam #1 (Lower) Springfield Water Works

The embankment forming this dam was noted to be in very good condition. The upstream rock paved face was okay. The turf on the downstream face was satisfactory and no seepage was noted at the toe of the embankment. The road crossing the embankment was okay. Water level in storage was at normal elevation and overflowed the lip of the circular vertical shaft spillway. The dam was considered safe when checked.

L. West Parish Filter Dam #2 (Middle) Springfield Water Works

The embankment of this dam was found to be in very good condition. The downstream face turf was good. Tree growth from the downstream

face and along the toe does not endanger the dam. The upstream face has been paved with loose, large-sized washed gravel. This surfacing appears to be very good. The paved road on top of the dam embankment was okay. No toe seepage was noted at the downstream edge of the structure.

The masonry inlet of the spillway was in satisfactory condition. On the day of inspection, only about one-half of the stoplogs were in place and water level was down somewhat from maximum elevation.

The spillway conduit through the embankment was in very good condition and clear of any debris. In the opinion of the undersigned, this dam was safe when inspected.

M. West Parish Filter Dam #3 (Upper) Springfield Water Works

The masonry forming the spillway crest at the right of the dam embankment was in good condition. Some of the stone masonry on the right wall of the channel between the crest and the roadway bridge is becoming dislodged but the condition is not bad enough as yet to require any repair work. The condition of this stone masonry will be watched at future inspections. The spillway channel itself was relatively clear of brush growth.

The embankment was in very good condition and no seepage was noted at the downstream toe. The upstream rock paved face was in good condition and the turf growth on the downstream face was satisfactory. There was no brush growth whatsoever on the embankment. The road across the top of the dam embankment was in good condition. In the opinion of the undersigned, this dam was safe when inspected.

N. Howard Smith Dam

The embankment of this dam is quite wide in relation to its low height. The embankment was in good condition. The top has a good turf cover and is well maintained. Some brush growth is occurring at the toe and downstream side of the embankment but as yet the brush growth is not bad. The swale spillway at the left end of the embankment on natural ground was in good condition and contained no brush growth or debris. The small spillway shaft inlet and tube through the embankment were satisfactory. Stoplogs in the spillway structure were at normal elevation and water level was at the upper elevation of the stoplogs.

Some toe seepage was noted but appeared to be normal for this small dam. In the opinion of the undersigned the structure is safe.

O. Stanley Park Dam

The embankment of this rebuilt dam has been completed and was noted to be in very good condition. The turf cover is fair. A flag-stone walk laid in masonry has been built across the entire length of the dam embankment. The intake structure was found to be okay. However, an opening has been broken into this structure and the opening covered with a fairly fine screen. This opening and screen are not shown on the approved reconstruction drawings of the dam.

The undersigned discussed this with the Park Maintenance Supervisor and pointed out to him that the screen could become plugged with leaves and the opening could thus fail to operate. He pointed out to me that this is an additional entrance into the spillway shaft and that the main spillway opening consisting of a pipe extending out into the pond has been installed and that this pipeline is the main discharge route for surplus water as required by the filed construction drawings. On this basis, I requested that a revised drawing of the spillway structure be filed showing the opening and screen as an additional spillway facility.

On the day of inspection, water level in storage was quite low, the pond having been drawn down for maintenance purposes. In the opinion of the undersigned, this dam was safe when inspected.

P. Florek Dam

On October 15, 1958, the undersigned submitted to your Honorable Board a report on plans and specifications for a proposed dam to be built by Mr. Florek. On October 29, 1958, your Board issued an Interlocutory Decree in connection therewith approving the plans and specifications. Since that time, no work whatsoever has been done on the dam. However, at the inspection this year, the undersigned found that construction work on the dam has been started. The vertical spillway shaft has been installed and the concrete tube through the embankment location has been laid. The owner and builder of the dam has varied the construction from the approved plans in that instead of using a corrugated iron vertical shaft spillway and a corrugated iron conduit through the embankment location, he has installed concrete pipe.

The concrete pipe conduit has been laid on a concrete foundation extending along the entire length of the conduit. This is an improvement and, in the opinion of the undersigned, is satisfactory.

No embankment construction has been started but the owner-contractor has placed some fill in the site of the embankment for the purpose of providing himself with a work area while building the vertical shaft of the spillway. He promised the undersigned that all of the loosely packed earth temporarily in place would be removed in the Spring and repacked as embankment construction in a proper manner. The owner-contractor does not expect to do any more work on the construction of the dam in 1966.

In the opinion of the undersigned, conditions at the site of this dam under construction are satisfactory.

Q. Pieczarka Realty Inc. Dam (Now J. G. Kulper)

This dam is in very poor condition. The embankment is not being maintained and it is very poorly shaped. The spillway structure is too small for the drainage area and the difference in elevation between the spillway and the top of the embankment is so small that there is little or no freeboard. On the day of inspection, water was flowing across the top of the embankment just to the right of the spillway. Water was also flowing through the embankment adjacent to the outside faces of the spillway structure.

A wooden bar rack was in the spillway opening and it was completely plugged with leaves to the point where it was breaking.

This dam still does not come under County jurisdiction. The drainage area is small, the height of the dam much less than 10 feet and the pond formed contains less than one million gallons. The dam is inspected routinely since there is always the possibility the dam will be raised and since it is immediately adjacent to State Highway Route 20. As pointed out previously, should this dam fail in time of storm flow, debris washed down by the failure might plug the culvert under State Highway Route 20 and as a result, the released water might damage the highway.

On August 5, 1964, your Honorable Board notified the owner of the dam of the conditions existing at that time and it was also pointed out that since the dam does not come under County jurisdiction, your Board was not directing the reconstruction of the dam.

Since the owner is aware of the conditions existing and since the conditions existing in 1964 are similar to those now reported, there would seem no need to notify the owner again.

R. Arm Brook Dam

This dam was inspected on Thursday, June 9, 1966 and a special report submitted to your Honorable Board on June 14, 1966. A letter in connection with maintenance recommendations was sent to the Mayor of Westfield by your Honorable Board on June 22, 1966. The conditions noted at the Arm Brook Dam are self-explanatory, and are contained in the special report.

S. Powder Mill Brook Dam

This dam was inspected on Thursday, June 9, 1966 and a special report submitted to your Honorable Board on June 14, 1966. A letter in connection with maintenance recommendations was sent to the Mayor of Westfield by your Honorable Board on June 22, 1966. The conditions noted at the Powder Mill Brook Dam are self-explanatory, and are contained in the special report.

Improvements are under construction at the toe of this dam. Upon activation of this dam, as reported previously to your Honorable Board, it was noted that seepage occurred in sufficient quantity to be of concern. The permanent pond behind the dam was drained and following this action the flow of water from the ground at the toe of the dam still occurred. To relieve any hydraulic pressure in the soil at the toe, the U. S. Soil Conservation Service designed relief wells and installed two wells at the toe of the dam, one on each side of the old brook valley.

The purpose of these relief wells was to allow the flow of water upward from the sub-surface strata while holding soil particles in place. These wells functioned but not as efficiently as hoped for. Consequently, it was decided by the Soil Conservation Service to further improve conditions at the toe of this dam by extending the conduit downstream, by filling over the extension to weight the area and then to build a relief filter extending from the surface of the ground down into the water bearing strata under the dam. This relief filter is being built by excavating deeply into the earth within the confines of driven sheeting. The water bearing strata is being dewatered with a well point system.

On completion of the excavation, the space between the sheeting will be filled with a processed and graded material which will allow a continuous path for relief of the hydraulic pressure under the dam to the surface of the ground in the bed of the brook below the dam.

Since this flow of underground water occurs even with the permanent pond drained, it is highly possible that the flow of water is not related to stored water behind the dam but to the movement of underground water from the left side of the stream valley.

In the opinion of the undersigned, the additional work at the toe of the dam will greatly improve conditions at the structure and greatly increase its safety.

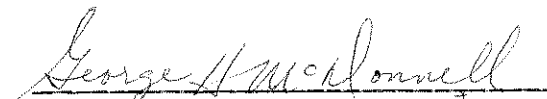
T. Milton Berman Dam on Munn Brook

This small dam is nothing more than a wall of loose cobblestones extending across the bed of Munn Brook on the Berman property. The wall is quite wide for its height. The height of the wall is estimated to average 15" above the bed of the brook. As existing, it forms nothing more than rapids in the flow of the brook. This small wall causes backwater to form a shallow pool adjacent to the Berman house and the pool is used as a duck pond and for aesthetic purposes.

In the opinion of the undersigned, this small structure does not endanger persons and property downstream since it impounds a negligible quantity of water at a depth of only about one foot more or less above normal brook depth.

Mr. Berman is aware of the requirement to file plans and specifications should he ever wish to enlarge this small cobblestone wall and consequently, since conditions as existing are safe, there seems to be no need for further inspections at this site. Conditions as noted at the time of the last inspection are no different than those noted over the past decade.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
June 14, 1966

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

On Thursday, June 9, 1966, an inspection was made of the Powder Mill Brook flood control dam and the Arm Brook multiple purpose dam in the City of Westfield. The inspection was made together with representatives from the Water Resources Commission, Commonwealth of Massachusetts, U. S. Soil Conservation Service and the Hampden Soil Conservation District. A report on general conditions noted at the two dams is as follows.

Powder Mill Brook Dam

This dam is in need of maintenance, particularly as relates to the development of a good sod and grass cover. There are many thin and bare spots on the dam embankment itself as well as on the emergency spillway. Little or no maintenance work has been done to develop the proper sod and grass cover. It is particularly important that a good thick sod be developed on the emergency spillway for in time of extreme flood flow conditions, this spillway will operate and if there is no good thick cover of sod on the spillway, the overflowing flood water will erode the spillway, do major damage to the spillway itself and the damage might extend to a point whereby the embankment of the dam would be endangered. It is important that every effort be made to develop a good growth of sod at an early date following the completion of a flood control structure of this type. Unless funds are expended to fertilize, cut and develop the surface growth, the potentially dangerous situation now existing will continue and will become more dangerous.

Though there is other minor maintenance work required at this dam such as the replacement of a manhole cover, the removal of a large

log from the inlet to the conduit, these two items have little or no effect on the safety of the dam.

It is recommended that the City of Westfield be advised that proper maintenance work should be done on the surface of the dam embankment and on the surface of the emergency spillway to develop an excellent growth of sod at a very early date.

Arm Brook Multiple Purpose Dam

This dam forms a small pond for recreation, fish and wildlife development purposes as well as for flood protection. A permanent pool of water formed in the bottom of the valley by this multiple purpose dam provides a body of water to be used by the citizens of Westfield for recreational purposes. An elevated intake structure upstream of the dam maintains the level of the permanent pool. In time of flood flow when runoff from the valley exceeds the capacity of the conduit thru the dam, the water level of the permanent pool increases in elevation to store flood waters and reduce flood flows downstream. Should flood flow continue to a point whereby the flood storage volume of the dam becomes full, then flood flows pass around the dam thru the grass-lined emergency spillway. As in the case of the Powder Mill Brook Dam, it is necessary that the turf growth on this spillway be in excellent condition. When inspected, it was found that the turf was fair to poor and in some areas little or no grass was growing whatsoever. Should flood flow conditions occur, and should the amount of runoff be great enough to cause the emergency spillway to operate, the rushing flood waters passing thru the spillway will cause the rapid formation of gullies in these areas where grass growth is quite poor. The gullies will then extend into the grassed areas and, if the flood flow conditions occur for any length of time, gully formation could be quite extensive and even reach the point where the dam embankment might be endangered.

The City of Westfield should be advised that proper maintenance should be carried on at this dam, particularly as relating to the development of an excellent growth of sod. Here again, the surface of the dam embankment and particularly the spillway itself, should be fertilized, cut and treated as needed to develop the necessary sod growth. Some of the bare areas would appear to need lime in order that grass growth and a thick sod will develop.

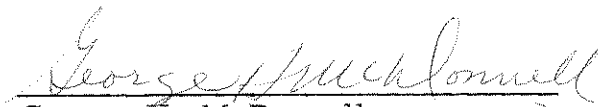
Other work needed at the dam has to do with the control of gully formation along the shoreline of the permanent pool near the entrance to the emergency spillway. Here numerous small gullies are forming and it would appear that filling of these gullies with a good coarse gravel will prevent any further extension of gully formation. Proper gravel placed in the gullies should stabilize the surface of the ground.

At the beach area across the permanent pool from the emergency spillway section, gullies have also been formed and these will become more extensive unless maintenance work is done on the beach area. Though these gullies do not affect the safety of the dam in any particular way, their formation results in soil being washed into the permanent pool and thus silting of the pool occurs together with the unsightly gully formation on the beach area.

There is a fairly large gully forming on the downstream face of the dam embankment at the left end of the embankment at the site of the access road to the toe of the dam. This has been formed by high rates of surface runoff during storm conditions and, unless this gully is filled with a good bony gravel, the gully will become larger and more expensive repairs will be needed at a later date. Additional construction work has been planned for the toe of the dam and this work will probably be accomplished during this Summer. Consequently, the access road leading to the toe of the dam will probably be used by the construction contractor. Since mis-use of this area will prevent the formation of a growth of grass and sod, temporary control of gully formation can best be done by the filling of the existing gully with the bony gravel.

It is recommended that the City of Westfield be advised of the conditions that exist at the two dams reported herein.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
June 23, 1966

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

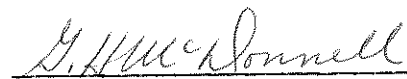
Gentlemen:

Recently I sent your Board my report relative to the inspection held at the Arm Brook Dam and the Powdermill Brook Dam in Westfield. A suggested communication was also included with my report for review and forwarding to the Mayor of Westfield if you concurred in its contents. The recommendations contained in my report and the suggested letter to Mayor Martin had to do with those items of work needing attention which would affect the safety of the dam.

I am enclosing a photocopy of a report from the U. S. Soil Conservation Service relative to conditions at the two dams as noted on the day of inspection, June 9, 1966. The contents of the report are all self-explanatory. You will note that the report has been distributed to all interested parties including the Mayor of Westfield.

I am forwarding the enclosed photocopy for your information and file on these two flood control dams.

Very truly yours,


George H. McDonnell +
County Hydraulic Engineer

GHM/mbf

POWDERMILL BROOK WATERSHED ANNUAL INSPECTION
by

June 9, 1966

Karl R. Klingelhofer
State Conservation Engineer
Soil Conservation Service
29 Cottage Street
Amherst, Mass. 01002

On June 9, 1966, the following people met at the Arm Brook site, Powdermill Brook Watershed, for the purpose of conducting an annual inspection of both the Arm Brook and Powdermill Brook sites:

Donald Kirby, Water Resources Commission, Massachusetts
George Hartley, Chairman, Hampden Conservation District
Nicholas Roselli, Hampden Conservation District
George McDonnell, Hampden County Engineer
Karl R. Klingelhofer, Soil Conservation Service

The City of Westfield was notified of this inspection, but did not send a representative.

ARM BROOK SITE

During the past year two relief wells were installed and the riprap reconstructed under contract to alleviate a foundation condition which exists at this dam site. The work performed did not solve the problem and additional work is planned. Within the next two months a new contract is expected to be awarded for the extension of the principal spillway conduit by 48 feet, the addition of an impact basin at the outlet of this conduit, the construction of a filter berm to an elevation that will cover the conduit extension and the installation of a deep relief trench extending to the aquifer that exists at approximately a 25-foot depth. It is anticipated that this work will solve the problem which has existed at this site -- the work to be completed by winter of 1966.

There has been practically no maintenance of the vegetative cover which exists at this site and it is rapidly deteriorating. Fertilization is desperately needed. Sixty pounds per acre of nitrogen, sixty pounds of P_2O_5 , and sixty pounds of K_2O should be applied. About 50 per cent of the nitrogen should be in the inorganic form.

The dam and emergency spillway should be mowed during the summer months.

There are two gullies in the beach area which should be repaired. Recommendations for the repair of these gullies can be obtained from the Soil Conservation Service.

It is quite possible that this site should be re-limed. Suggest that the local County Agent or an SCS technician be asked to check the PH and recommend a liming rate.

The tile drain outlet which is located along the shore line at the inlet to the emergency spillway is apparently covered over. This should be located and uncovered.

There is an abundance of litter in the woods along the access road which should be cleaned up.

POWDERMILL BROOK SITE

For the Powdermill Brook site, the same comments and recommendations regarding lime, fertilizer and mowing as were made for the Arm Brook site, apply. Here again the vegetation is in desperate need of proper care.

The manhole cover for the riser has been removed. This should be replaced.

There is a log near the riser that should be removed and disposed of.

The stand of vegetation that exists on both of these sites is adequate. With proper care and maintenance, a dense turf would develop. This turf is especially important and is needed in the emergency spillways. Sufficient funds and the means for doing this work were to have been established according to the Operations and Maintenance Agreement that was signed by the City of Westfield.


Karl R. Klingelhofer, State Cons. Engr./wmb

cc: George McDonnell, County Engr.,
Tighe & Bond, 211 Bowers and Pequot Sts.,
Holyoke, Mass. 01040
George Hartley, Chairman, Hampden Cons. District
Malcolm Graf, Director, Water Resources Commission
Don Weinle, Westfield City Engineer
Harold J. Martin, Mayor of Westfield
Conlin, WUC, West Springfield
Klingelhofer
R. Brown
W.S. file

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
May 2, 1968

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

On Tuesday afternoon, April 30, 1968, an inspection was made of the Arm Brook Multiple Purpose Dam and the Powder Mill Brook Flood Control Dam in the City of Westfield. The inspection was the annual inspection made together with representatives from the Massachusetts Water Resources Commission, U.S. Soil Conservation Service, Hampden Soil Conservation District and the City of Westfield. A report on the general conditions noted at each of the two dams is as follows:

Arm Brook Multiple Purpose Dam

This flood control dam forms a permanent small pool for recreation and for fish and wild life development purposes. The permanent pool of water formed in the bottom of the valley by this multiple purpose dam provides a sizeable body of water to be used by the citizens of Westfield for recreational and related purposes. An elevated intake structure upstream of the dam maintains the level of the permanent pool. In time of flood flow conditions when run-off from the valley exceeds the capacity of the conduit through the dam, the water level of the permanent pool increases in elevation and flood flows are stored to reduce the rate of stream flow below the dam. Should flood flow run-off above the dam continue to a point whereby the flood storage volume formed by the dam becomes full, surplus flood flow water would pass around the dam through a grass-lined emergency spillway.

Because of the possible discharge of excess flood flows by this spillway, it is essential that the turf growth on the floor and on the side slopes of the spillway be in excellent condition.

The grass and turf cover on the embankment and the spillway should be repaired and strengthened along the top of the dam embankment, at various locations of thin growth on the spillway, at the toe of the right hand slope and at the central downstream toe of the embankment.

Erosion along the left toe at the bank of the stream valley should be controlled.

On the left bank of the stream at the lower berm ditch where erosion has occurred and broken stone placed to control erosion, the problem of soil movement still exists. Further improvement can be made by the installation of a short section or sections of 12" corrugated iron pipe to carry the surface run-off down to the side brook course. The pipe should then be covered with compacted fill and the fill loamed, seeded and fertilized. The pipe should have a scoop type inlet at its upper end.

Vehicular traffic running along the top of the left bank of the spillway should be discouraged and, if possible, prevented by erecting fences and barricades.

Erosion along the top edge and sloping face of the left spillway bank and berm upstream of the flood flow spillway crest should be prevented. The poor turf cover on the slope of the left spillway side bank in this same general area should be greatly improved.

Downstream of the stilling basin at the toe of the dam at a point 80 feet more or less from the stilling basin and at the right bank of the stream, some seepage is emerging. This seepage appears to be of no importance at this time and probably is related to ground water conditions as a result of the recent heavy precipitation. This seepage is noted herein and will be observed in future inspections.

Just to the right of the observation well near the right downstream corner of the riprap below the stilling basin, there is a deposit of typical iron slime in the bed of the stream. No motion of water in the form of seepage was noted in this general area. The condition is recorded herein for future observations and for comparison purposes.

Powder Mill Brook Dam

This dam is a flood control dam and normally has no small pool formed in the valley above the dam. On the day of inspection there was a small pool as a result of the gate at the intake structure being closed.

The turf cover on the embankment and on the spillway, is poor in a number of areas in various sections of the embankment, the flood flow spillway floor and the side slopes of the flood flow spillway. All poor areas should be treated to improve the turf cover. Particular attention should be given to the portion of the flood flow spillway downstream from the crest.

At the concrete pipe spillway through the embankment, the joint on the upper end of the last length of pipe is in need of caulking and repair.

All brush growth and small trees in the forebay of the flood flow spillway and on the side slope between the spillway and the dam embankment, pond side of the dam, should be cut down.

Two gullies at the right end of the dam on the upstream face, one near the top of the embankment and one near the lower berm, should be repaired and further erosion discouraged.

Logs in the pond at the spillway inlet should be removed. Large logs lying on the ground in the pond area directly across from the flood flow spillway and to the west of the intake structure should all be removed and disposed of. If allowed to remain as they are, they will be floated away in time of flood flow and may cause plugging of the spillway tube inlet.

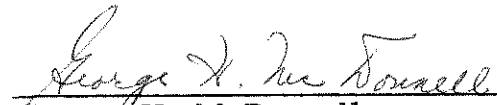
A fence or similar barricade should be erected as needed to prevent vehicular traffic on the various sections of the dam and spillway.

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It is recommended that the City of Westfield be advised of the conditions that exist at the two dams reported herein and the City should be directed to take the necessary steps to correct the undesirable conditions as noted herein.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
August 30, 1968

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

All of the dams situated within the City of Westfield have now been inspected at least once during the present calendar year. The following is a report on the conditions noted at each dam in Westfield:

A. Horse Pond Dam, Westfield Board of Water Commissioners

The embankment of this dam is in fairly good shape. All brush growth should be cut from the embankment. The toe area was satisfactory and no seepage was noted. The water level in storage was found to be back up to about normal elevation. Water surface was measured as about 2" below the level of the stone side shelf in the spillway. A stoplog was in the spillway notch and the top of the log was about 2" above the stone shelf. The spillway structure itself was in satisfactory condition.

In the opinion of the undersigned, this small dam is safe but it should receive better maintenance thru the removal of brush growth and the development of a good turf cover on the embankment.

B. Chapin Pond Dam, Westfield Board of Water Commissioners

This dam is very poorly maintained by the City of Westfield. Tree and brush growth occurring on the dam embankment should be cut down. The sunken section of the roadway at the gate manhole and at the easterly edge of the roadway paved surface should be filled and repaired.

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A suction pipe apparently installed to feed the intake of an irrigation pump which was set up on the downstream side of the dam has been laid thru the dam embankment at an elevation just above normal water elevation. It is doubtful if anti-seep provisions have been included with this pipeline installation. The end of the pipe is now open on the downstream side of the dam and should high water occur in the pond, water will flow out of the end of the discharge pipe. The water carried by the pipe will cause erosion on the ground at the toe of the dam. This discharge pipe should be plugged with a plumbing fitting so it will not cause erosion. If anti-seep protection was not included when the pipeline was installed, then the pipeline should be dug out and re-laid properly.

The spillway channel needs to be cleaned of debris and the bridge abutments should be rebuilt. Flood flows may result in washing out the very poor existing spillway bridge abutments. If one or both abutments fail, the bridge will fall into the spillway channel and may possibly act as a barrier to flood flows. If this does happen, the dam could be overtopped and washed out.

The City of Westfield should take more interest in proper maintenance of this structure. In the opinion of the undersigned, the dam should be repaired and maintained.

C. Westfield Sportsmen's Club Dam

This dam does not appear to be receiving the same quality of maintenance as in past years. The right spillway section is partially blocked with logs and debris. These should all be cleared from the spillway.

A large log in the pond at the shoreline on the end of the dam near the access road should be taken out of the pond so that it will not be washed against the spillway opening and plug the opening in time of storm flow conditions.

Seepage thru the grouted rock filled spillway was noted to be about normal. Brush and small tree growth on the downstream slope of the embankment and along the toe of the embankment should be cut down.

The shape of the embankment is satisfactory. The broken stone surfacing on the water side of the dam is in satisfactory condition. Water level in storage was at the crest of the spillway on the day of inspection. In the opinion of the undersigned, the dam was safe when inspected but needed the recommended maintenance and attention.

D. Tekoa Dam - Westfield Board of Water Commissioners

The stone masonry of this dam is in fair to good condition. Vegetation is growing from the masonry joints and should be removed. Future growth should be discouraged.

The spillway notch was in satisfactory condition. No flashboards were on the crest and water in storage was overflowing thru the spillway notch.

The sunken and undermined area at the outside face of the downstream end of the stone masonry toe wall adjacent to the turn-around roadway has not been repaired and the condition is worse now than it was when previously reported. Lack of attention to the previous recommendation and lack of maintenance will result in further undermining of this small wall as a result of surface water run-off washing under the wall. The present condition could be repaired by two men with proper tools and materials, in less than 30 minutes. If allowed to further deteriorate it may eventually be necessary to replace a sunken and failed small masonry curb wall at a much greater expense. This condition does not affect the safety of the dam. However, repairs should be made so that the drainage trough along the toe of the stone masonry wall forming the dam will continue to function properly and will not eventually fail, to do settlement in the area reported herein.

In the opinion of the undersigned, the dam is safe.

E. A. H. Wilgus Dam (owner Hank Wilgus, Sunnyside Beach and Camp Grove)

No change has taken place at this dam since the time of the last inspection report. The dam is still breached as a result of the flood of August, 1955 and the opening thru the dam is wide and deep enough to safely pass flood flows. The pool of water at the site is an artificial pond built in the side of the stream valley and fed by water conveyed thru a pipeline from an upstream point in the brook. Since the pond as existing, does not receive the flow of the brook, the structure does not come under County jurisdiction.

The inspection was made in the presence of the wife of the owner who indicated that no change is planned in connection with the dam.

F. Stevens Paper Company - Lower Dam

The right abutment and related retaining wall was noted to be in satisfactory condition. Some erosion and wear of the masonry was observed. However, this condition is of no concern at the present time.

The crest of the dam and the individual ice sheet breakers were o.k. Very little erosion was noted on the face of either abutment at the crest line.

The toe of the dam and the rock ledge of the river bed onto which the dam has been built were noted to be o.k. Water was overflowing the crest and a determination of toe and face leakage was not possible except from an observation point downstream. From this inspection position some leakage was noted squirting thru the stone masonry of the dam below the crest masonry. This leakage is not of any concern insofar as safety of the dam is concerned. The stone masonry face was noted to be on good alignment.

The left abutment stone masonry and the concrete masonry upstream abutment and intake structure wall were satisfactory.

The earth dike at the left of the dam was in satisfactory condition. The top of the dike and the downstream face has a good turf cover. No toe seepage was noted.

The riprap surface of the earth dike was in good condition. Near the abutment additional riprap had been added along with broken stone. All of this newly added material has been bound together with cement grout.

At the time of the previous inspection a recommendation was made relative to improvements needed to the riprap in the vicinity of the abutment. This work has been done as described hereinbefore.

In the opinion of the undersigned, this dam is safe.

G. Stevens Paper Company - Upper Dam

The stone masonry of this dam is in good condition. No flashboards were on the crest of the dam, most of them having been washed off by high rates of stream flow. The crest stones were noted to be in good alignment and on good grade. At the time of the inspection water was

overflowing the crest. The face of the stone masonry dam as viewed thru the overflowing sheet of water was noted to be o.k.

Abutment areas were satisfactory. Stone masonry was in good condition and the joints between the individual stones were satisfactory. The concrete flood training wall built on top of the left abutment were o.k.

In the opinion of the undersigned, this dam is safe.

H. Springfield Water Works Intake Dam

This dam was found to be in satisfactory condition. The concrete was o.k. and the dam in general, was satisfactory at both abutments, at the toe and at the right hand gate facilities.

In the opinion of the undersigned, this dam is considered to be safe.

I. West Parish Filter Dam #1 (Lower) Springfield Water Works

The embankment was found to be in good condition. The upstream stone paving was satisfactory. The gravel roadway across the top of the embankment showed no evidence of settlement. Some weed growth was noted on the embankment downstream face but it is not thick enough to need attention at this time. The toe area was dry.

The spillway shaft and the tube thru the embankment were o.k. The outlet facility at the toe of the dam was satisfactory.

The around-the-end stone paved emergency spillway channel was in relatively good condition. A considerable growth of weeds is taking place in the channel but this growth will not interfere, to any great extent, to emergency flows occurring in the spillway channel.

In the opinion of the undersigned, the dam is safe.

J. West Parish Filter Dam #2 (Middle) Springfield Water Works

This dam is in the same general condition as previously reported. The embankment is in good condition and the downstream face has a good growth of turf. The tree growth along the toe and on the downstream face does not endanger the dam. The washed gravel surface on the upstream face is o.k. though some weed growth is beginning to take place.

The paved roadway across the top of the dam embankment was in satisfactory condition. No sunken areas were noted. There was no seepage noted along the embankment toe.

The spillway inlet was in satisfactory condition and water level was at normal elevation. The conduit thru the embankment was o.k. In the opinion of the undersigned, the dam was safe when inspected.

K. West Parish Filter Dam #3 (Upper) Springfield Water Works

The embankment is in good condition. It has a good turf surface on the downstream slope and the rock filled surface on the reservoir side was noted to be o.k. The road extending along the top of the dam for its entire length, was satisfactory. The toe area of the embankment was dry.

The overflow structure at the right end of the dam was in satisfactory condition. There were no flashboards on the crest. The discharge channel was satisfactory.

In the opinion of the undersigned, this dam was safe when inspected.

L. Howard Smith Dam

The embankment forming this dam is relatively wide for its low height. The top of the embankment is covered with a good growth of turf. There is brush growth on the downstream face and at the toe area. However, because of the large width of the embankment in relation to its low height, this brush growth does not endanger the dam.

The spillway shaft was found to be in satisfactory condition. The swale spillway at the left end of the embankment was o.k. Water in storage was up to the elevation of the top of the stoplogs in the shaft spillway. The pond formed is quite shallow.

In the opinion of the undersigned, the dam is safe.

M. Stanley Park Dam

The embankment forming this small dam has been further enlarged and has been greatly improved. It is wider, better shaped, and has a very good turf cover. A flagstone sidewalk with the individual stones set in concrete masonry extends along the entire length of the dam.

TIGHE & BOND CONSULTING ENGINEERS

The spillway inlet shaft was satisfactory. The toe of the dam was dry insofar as seepage is concerned. Just downstream of the toe a small pond has been formed for aesthetic purposes. The dam and the entire surrounding area is very well maintained. At the time of inspection water level was at the crest of the spillway.

In the opinion of the undersigned, the dam is safe.

N. Florek Dam

The undersigned discussed this dam with the owner and with his son on the day of inspection, August 23, 1968. No work whatsoever has been done on the dam since the time of the last inspection. The brook still flows past and thru the site where the dam will eventually be built. Mr. Florek informed the undersigned that he has no idea at this time as to when he will proceed further with construction.

As existing, the concrete pipe conduit has been laid on a concrete foundation extending along the length of the conduit. No permanent embankment construction has been started. Some earth fill has been placed to provide a work area for use in constructing the vertical shaft of the spillway. The owner recognizes the fact that when he continues with the work, the earth embankment material must be thoroughly and properly placed and compacted.

O. Pieczarka Realty Inc. Dam (now J. G. Kulper)

This dam is in the same general condition as previously reported. It is in need of maintenance and improvements. The embankment needs to be enlarged and the freeboard increased. The spillway capacity is too small. However, this dam still does not come under County jurisdiction. The owner has been advised in the past of the condition of the dam and recommendations were passed on to him regarding the protection of his investment in this property thru proper maintenance in the embankment as well as spillway enlargement.

Though, in the opinion of the undersigned this dam is in poor condition, there is no action that can be taken since the structure is outside of the jurisdiction of the County.

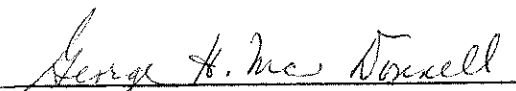
P. Arm Brook Dam

This dam was inspected twice during the present year. A report on the conditions noted at this dam was submitted on May 2, 1968. Consequently, there is no need to repeat the report herein and I refer your Honorable Board to the comments made in the previous report. A copy of the report was sent to the Mayor of Westfield by your Board on May 8, 1968.

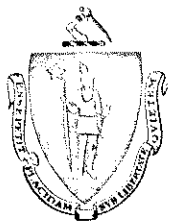
Q. Powder Mill Brook Dam

This dam was inspected twice during the present year. A report on the conditions noted at this dam was submitted on May 2, 1968. Consequently, there is no need to repeat the report herein and I refer your Honorable Board to the comments made in the previous report. A copy of the report was sent to the Mayor of Westfield by your Board on May 8, 1968.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd



Commonwealth of Massachusetts

COPY

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Ralph P. Walsh
Floyd W. Fradet

September 4, 1968

Board of Water Commissioners
Westfield Water Department
Municipal Building
Westfield, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam at Hampton Ponds known as Horse Pond Dam, and your dams at Chapin Pond as well as Tekoa Intake Reservoir have been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"Horse Pond Dam

The embankment of this dam is in fairly good shape. All brush growth should be cut from the embankment. The toe area was satisfactory and no seepage was noted. The water level in storage was found to be back up to about normal elevation. Water surface was measured as about 2" below the level of the stone side shelf in the spillway. A stoplog was in the spillway notch and the top of the log was about 2" above the stone shelf. The spillway structure itself was in satisfactory condition.

In the opinion of the undersigned, this small dam is safe but it should receive better maintenance thru the removal of brush growth and the development of a good turf cover on the embankment.

Chapin Pond Dam

This dam is very poorly maintained by the City of Westfield. Tree and brush growth occurring on the dam embankment should be cut down.

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The sunken section of the roadway at the gate manhole and at the easterly edge of the roadway paved surface should be filled and repaired.

A suction pipe apparently installed to feed the intake of an irrigation pump which was set up on the downstream side of the dam has been laid thru the dam embankment at an elevation just above normal water elevation. It is doubtful if anti-seep provisions have been included with this pipeline installation. The end of the pipe is now open on the downstream side of the dam and should high water occur in the pond, water will flow out of the end of the discharge pipe. The water carried by the pipe will cause erosion on the ground at the toe of the dam. This discharge pipe should be plugged with a plumbing fitting so it will not cause erosion. If anti-seep protection was not included when the pipeline was installed, then the pipeline should be dug out and re-laid properly.

The spillway channel needs to be cleaned of debris and the bridge abutments should be rebuilt. Flood flows may result in washing out the very poor existing spillway bridge abutments. If one or both abutments fail, the bridge will fall into the spillway channel and may possibly act as a barrier to flood flows. If this does happen, the dam could be overtopped and washed out.

The City of Westfield should take more interest in proper maintenance of this structure. In the opinion of the undersigned, the dam should be repaired and maintained.

Tekoa Dam

The stone masonry of this dam is in fair to good condition. Vegetation is growing from the masonry joints and should be removed. Future growth should be discouraged.

The spillway notch was in satisfactory condition. No flashboards were on the crest and water in storage was overflowing thru the spillway notch.

The sunken and undermined area at the outside face of the downstream end of the stone masonry toe wall adjacent to the turn-around roadway has not been repaired and the condition is worse now than it was when previously reported. Lack of attention to the previous recommendation and lack of maintenance will result in further undermining of this small wall as a result of surface water run-off washing under the wall. The present condition could be repaired by two men with proper tools and

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materials, in less than 30 minutes. If allowed to further deteriorate it may eventually be necessary to replace a sunken and failed small masonry curb wall at a much greater expense. This condition does not affect the safety of the dam. However, repairs should be made so that the drainage trough along the toe of the stone masonry wall forming the dam will continue to function properly and will not eventually fail, to do settlement in the area reported herein.

In the opinion of the undersigned, the dam is safe."

The work as recommended by the County Hydraulic Engineer in his report should be done in order to protect the investment represented by these dams and, in the case of the Chapin Pond Dam, to protect lives and property downstream of the dam, we urge that all recommended improvements and maintenance which can be done this year should be completed before cold weather. Any work remaining should be planned for the coming year and funds should be provided in your budget to do this work.

Any further information concerning these dams which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
May 29, 1969

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

On Friday morning, May 23rd, the undersigned met with a representative of the Soil Conservation Service, Mr. James Elasmr, Project Engineer, and Mr. Thomas F. Doucette, Senior Civil Engineer of the Massachusetts Water Resources Commission, for the annual inspection of the Arm Brook Multiple Purpose Dam and the Powder Mill Brook Flood Control Dam in the City of Westfield. Normally, representatives of the city are present for the inspection. However, no representative of the city made the inspection this year. My report on the general conditions noted at each of the two dams is as follows:

Arm Brook Multiple Purpose Dam

Conditions at this dam have improved since the time of the last inspection. The dam forms a permanent small pool for recreation and for fish and wildlife development purposes. The permanent pool is formed in the bottom of the valley and provides a body of water used by local citizens for general outing and recreational purposes.

The grass and turf cover on the embankment of the dam is in far better condition than a year ago. However, certain areas are still thin, and additional seeding and fertilizing is advisable to strengthen and thicken the turf development.

A gully eroded into the surface at the left downstream end of the dam embankment should be repaired and further washing out of soil controlled. This gully is in the valley formed by the left downstream face of the embankment as it meets the left valley bank of the stream. Washed gravel or broken stone placed in the gully will probably prevent extension of the erosion.

On the left bank of the stream valley at the lower end of the berm ditch, erosion was reported previously and recommendations were made relative to preventing extension of the eroded gully. A corrugated iron pipe was recommended to carry the surface runoff where the water is now eroding the soil. Nothing has been done relative to this problem and corrective action should be taken.

Vehicular traffic, probably motorcycle traffic, is damaging the turf development on the left side of the emergency spillway at about the crest location. All traffic should be prevented from driving on the embankment and in the spillway.

The observation well downstream and to the right of the outlet facility in the valley of the brook has a solid iron cap on top of the well pipe. This should be replaced with a heavy screen or the solid cap should be drilled.

The brook valley downstream of the dam embankment was inspected and no seepage of any consequence was noted. Typical iron slime was noted in the bed of the stream just to the right of the observation well referred to hereinbefore. The condition is very similar to that observed a year ago and the presence of the slime is of no concern at this time.

Powder Mill Brook Dam

The inspection of this dam showed that conditions now existing are the same as those reported a year ago. Nothing has been done to correct the deficiencies then reported.

The following is a repetition of the report of last year:

This dam is a flood control dam and normally has no small pool formed in the valley above the dam. On the day of inspection there

was a small pool as a result of the gate at the intake structure being closed.

The turf cover on the embankment and on the spillway, is poor in a number of areas in various sections of the embankment, the flood flow spillway floor and the side slopes of the flood flow spillway. All poor areas should be treated to improve the turf cover. Particular attention should be given to the portion of the flood flow spillway downstream from the crest.

At the concrete pipe spillway through the embankment, the joint on the upper end of the last length of pipe is in need of caulking and repair.

All brush growth and small trees in the forebay of the flood flow spillway and on the side slope between the spillway and the dam embankment, pond side of the dam, should be cut down.

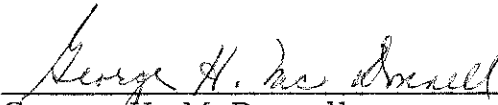
Two gullies at the right end of the dam on the upstream face, one near the top of the embankment and one near the lower berm, should be repaired and further erosion discouraged.

Logs in the pond at the spillway inlet should be removed. Large logs lying on the ground in the pond area directly across from the flood flow spillway and to the west of the intake structure should all be removed and disposed of. If allowed to remain as they are, they will be floated away in time of flood flow and may cause plugging of the spillway tube inlet.

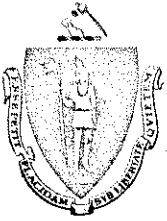
A fence or similar barricade should be erected as needed to prevent vehicular traffic on the various sections of the dam and spillway.

It is recommended that the City of Westfield be advised of the conditions that exist at the two dams reported herein and the City should be directed to take the necessary steps to correct the undesirable conditions as noted herein.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd



Commonwealth of Massachusetts

COPY

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Ralph P. Walsh
Lloyd M. Fradet

June 4, 1969

The Honorable John J. Palczynski
Mayor of Westfield
Municipal Office Building
Westfield, Massachusetts

Re: Arm Brook and Powder Mill Brook Dam

Dear Mayor Palczynski:

The annual inspection of the two above subject dams was conducted on Friday, May 23, 1969, with only a representative of the Massachusetts Water Resources Commission, the Soil Conservation Service, and the County Hydraulic Engineer present. The report of the County Hydraulic Engineer has been submitted to our Board and in order that you may be aware of the required maintenance and repair work needed at the two dams, his report is set forth hereinafter as follows:

Arm Brook Multiple Purpose Dam

"Conditions at this dam have improved since the time of the last inspection. The dam forms a permanent small pool for recreation and for fish and wildlife development purposes. The permanent pool is formed in the bottom of the valley and provides a body of water used by local citizens for general outing and recreational purposes.

The grass and turf cover on the embankment of the dam is in far better condition than a year ago. However, certain areas are still thin, and additional seeding and fertilizing is advisable to strengthen and thicken the turf development.

A gully eroded into the surface at the left downstream end of the dam embankment should be repaired and further washing out of soil controlled. This gully is in the valley formed by the left downstream face of the embankment as it meets the left valley

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bank of the stream. Washed gravel or broken stone placed in the gully will probably prevent extension of the erosion.

On the left bank of the stream valley at the lower end of the berm ditch, erosion was reported previously and recommendations were made relative to preventing extension of the eroded gully. A corrugated iron pipe was recommended to carry the surface runoff where the water is now eroding the soil. Nothing has been done relative to this problem and corrective action should be taken.

Vehicular traffic, probably motorcycle traffic, is damaging the turf development on the left side of the emergency spillway at about the crest location. All traffic should be prevented from driving on the embankment and in the spillway.

The observation well downstream and to the right of the outlet facility in the valley of the brook has a solid iron cap on top of the well pipe. This should be replaced with a heavy screen or the solid cap should be drilled.

The brook valley downstream of the dam embankment was inspected and no seepage of any consequence was noted. Typical iron slime was noted in the bed of the stream just to the right of the observation well referred to hereinbefore. The condition is very similar to that observed a year ago and the presence of the slime is of no concern at this time.

Powder Mill Brook Dam

The inspection of this dam showed that conditions now existing are the same as those reported a year ago. Nothing has been done to correct the deficiencies then reported.

The following is a repetition of the report of last year:

This dam is a flood control dam and normally has no small pool formed in the valley above the dam. On the day of inspection there was a small pool as a result of the gate at the intake structure being closed.

The turf cover on the embankment and on the spillway, is poor in a number of areas in various sections of the embankment, the

COPY

flood flow spillway floor and the side slopes of the flood flow spillway. All poor areas should be treated to improve the turf cover. Particular attention should be given to the portion of the flood flow spillway downstream from the crest.

At the concrete pipe spillway through the embankment, the joint on the upper end of the last length of pipe is in need of caulking and repair.

All brush growth and small trees in the forebay of the flood flow spillway and on the side slope between the spillway and the dam embankment, pond side of the dam, should be cut down.

Two gullies at the right end of the dam on the upstream face, one near the top of the embankment and one near the lower berm, should be repaired and further erosion discouraged.

Logs in the pond at the spillway inlet should be removed. Large logs lying on the ground in the pond area directly across from the flood flow spillway and to the west of the intake structure should all be removed and disposed of. If allowed to remain as they are, they will be floated away in time of flood flow and may cause plugging of the spillway tube inlet.

A fence or similar barricade should be erected as needed to prevent vehicular traffic on the various sections of the dam and spillway.

It is recommended that the City of Westfield be advised of the conditions that exist at the two dams reported herein and the City should be directed to take the necessary steps to correct the undesirable conditions as noted herein."

It is necessary that these dams be well maintained and be in a suitable condition to withstand flood flow conditions. The various recommendations and needed repairs as pointed out in the report of the County Hydraulic Engineer should be accomplished as soon as possible, in any event, prior to the Fall rainy weather season.

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If you have any questions in connection with the report please call or write our Board.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GEORGE H McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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TEL. JEFFERSON 3-3991

CD Westfield
December 2, 1969

The Honorable the Board of County Commissioners
52 State Street
Springfield, Mass.

Gentlemen:

All of the dams located within the City of Westfield have now been inspected at least once during the year 1969. The following is a report on the conditions noted at each dam within the City of Westfield.

A. Horse Pond Dam, Westfield Board of Water Commissioners

This small earthen embankment dam was found to be in satisfactory condition. No toe seepage was observed. There is some brush growing on a portion of the embankment but the growth is not thick enough this year to be of any concern.

The spillway masonry is in satisfactory condition. The stoplogs were observed in the notch of the spillway to a point about 1" above the side shelves of the stone masonry. The water level in storage was at the elevation of the top of these stone shelves and thus was within 1" of overflowing the stoplogs.

In the opinion of the undersigned this dam is in satisfactory condition and is safe.

B. Chapin Pond Dam, Westfield Board of Water Commissioners

This dam is in the best condition noted in recent years. The embankment is fair to good. Brush has been cut from the surfaces of the embankment.

A turf cover should be developed on the sloping surface of the downstream side. The rip-rap on the slope toward the pond is rough but okay.

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A large oak tree growing from the top of the dam embankment near the downstream edge should be cut down and the root growth killed.

The spillway channel was observed to be free of debris. Better bridge abutments are desirable and should be constructed in the near future.

The toe area of the embankment was wet but the condition was observed to be satisfactory.

The irrigation pipe through the dam embankment at the right end has been capped, as recommended.

On the day of inspection water level in storage was at the elevation of the spillway channel and was overflowing through the spillway at a fairly high rate.

The dam is safe but the large oak tree should be removed and the owner should begin to develop a turf cover on the downstream slope as recommended.

C. Westfield Sportsmen's Club Dam

On the day of inspection the pond was empty and the drain gate was open. The swinging fish screens were free and will operate properly.

The embankment was observed to be in fair condition. The road across the top was okay.

All brush growth should be cleared from the downstream embankment face and from the toe area. A good sod growth should be developed on the downstream face and on the toe area of the dam.

The pond side slope was okay. The broken stone surfacing is serving very well.

Some minor erosion was noted at the spillway grouted rip-rap. Repairs to the eroded areas should be made in the near future to prevent the need from more extensive and possibly more expensive repairs at a later date.

In the opinion of the undersigned the dam is safe but the recommended maintenance work should be done in 1970.

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D. Tekoa Dam--Westfield Board of Water Commissioners

The stone masonry forming this dam is in good condition. Some vegetation is growing from the joints in the masonry. The condition has been reported in the past.

Abutment areas are okay. The sunken area at the lower end of the drainage curb wall has been filled in. A small depression still exists. This will be observed in the future for any extension of the settlement.

On the day of inspection water level was at the spillway notch. The crest of the spillway was okay and there was no flashboards on the spillway.

In the opinion of the undersigned this dam is safe.

E. A. H. Wilgus Dam (owner Hank Wilgus, Sunnyside Beach and Camp Grove)

Nearly all evidence of this dam now has been either washed away or removed. No water will be ponded at the site in the future and the brook valley is wide open to the depth of the brook.

No further inspections are needed at the site of this old dam and it is recommended that the dam be dropped from the inspection list.

F. Stevens Paper Company - Lower Dam

The right abutment at this dam was noted to be okay. The masonry is in good condition.

The crest of the dam was satisfactory as to grade and alignment. Very little erosion of the masonry was observed. The ice sheet breakers on the crest were noted to be okay.

The left abutment stone masonry at the end of the dam crest has open joints. This condition is not bad enough as yet to require repairs. However, these joints will be observed in future years and when repairs are thought advisable, a recommendation will be made in connection therewith.

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The toe area of the dam appeared to be okay. Water was overflowing the dam and it was difficult to observe the toe. There is some leakage at the masonry joints of the dam and water was observed squirting through joint leaks behind the curtain of overflowing water. This condition is no worse than noted in the past and is not dangerous.

The left earth embankment dike was in good condition. It is covered with a good growth of turf on top and on the dry side. The water side slope is rip-rapped and a portion of the rip-rap has been grouted.

No toe seepage at all was observed.

In the opinion of the undersigned this dam is in satisfactory condition and is safe.

G. Stevens Paper Company - Upper Dam

The dam itself was noted to be okay. The crest is good. Grade and alignment were noted to be okay. Most of the flashboards have been washed away and water level in storage was overflowing the permanent crest of the dam.

The face of the dam appeared to be good as viewed through the sheet of overflowing water. The toe area seemed satisfactory.

The left stone masonry abutment was okay. The concrete flood training wall on top of this abutment was in good condition.

The right abutment stone masonry was also in good condition.

In the opinion of the undersigned, this dam is satisfactory and is safe.

H. Springfield Water Works Intake Dam

This dam was in satisfactory condition. Some spalling and peeling of concrete was observed on the surface but the condition is not bad. The abutment at the left was okay.

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The abutment at the right, including the gate and overflow structure were all okay. The crest of the main overflow dam was in fair to good condition. No flashboards were on the crest. Water level in storage was low.

Toe area in the stream was okay.

The water supply intake structure and the rail rack in front of the intake were noted to be okay.

In the opinion of the undersigned this dam is safe.

I. West Parish Filter Dam #1 (Lower) Springfield Water Works

The embankment forming this dam is okay. The gravel road across the top of the embankment is good. The downstream side grass growth was good. Large tree growth was noted at the toe but this is okay. The toe area was dry.

The spillway vertical pipe shaft was in satisfactory condition and water level in storage was overflowing the crest. The steel tube through the embankment was in good condition and the outlet end was satisfactory.

The swale spillway which extends around the right end of the dam was in satisfactory condition. It is partially plugged with brush and vegetation growth but this is not thick enough to cause any problem in time of spillway operation.

In the opinion of the undersigned, this small dam is safe.

J. West Parish Filter #2 (Middle) Springfield Water Works

The embankment is in good condition. The washed stone surface of the slope on the water side was in good condition. There is some brush and weed growth occurring but it is not thick enough as yet to be of any concern.

The paved roadway across the embankment was noted to be okay. The downstream slope was in good condition. The grass cover was satisfactory.

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Many medium size trees are growing from the downstream slope but because the dam embankment is very wide for its relatively shallow height, these trees do not endanger the dam. Toe area was dry.

The spillway structure inlet was okay. Some stoplogs were in the slots and water was passing over the upper stoplog. The conduit through the embankment was satisfactory.

In the opinion of the undersigned, this dam is in good condition and is safe.

K. West Parish Filter Dam #3 (Upper) Springfield Water Works

The masonry wall forming the spillway at this dam was okay. There were no flashboards on the wall and water level in storage was well below the crest elevation.

The embankment was okay. The gravel road extending across the top showed no evidence of settlement or cracking. The stone surface on the wet slope was okay. Some small amount of brush is growing from the upper edges of the slope and along a portion of the top of the embankment but this growth is not bad enough as yet to require cutting.

The dry side slope was okay. Grass cover observed was fair to good. The toe of the embankment was dry.

In the opinion of the undersigned, this dam is safe.

L. Howard Smith Dam

The top of the embankment was observed to be good. Turf cover was satisfactory and hardly any brush growth was noted on the top of the embankment. Some brush growth was noted on the downstream face and at the toe area near the left of the embankment but this growth does not prevent inspection of the dam nor does it endanger the embankment.

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CONSULTING ENGINEERS

The normal spillway is operating and stoplogs were at maximum elevation. The pond was full on the day of inspection, November 19th.

The swale spillway around the left end of the embankment was okay as to shape and was free of any brush or debris.

The toe of the embankment was reasonably dry. One small sink hole was noted on the top surface of the embankment directly in front of the normal spillway inlet structure. This settlement will be observed next year for any extension in area or increase in depth.

In the opinion of the undersigned, this dam is safe.

M. Stanley Park Dam

The embankment forming this dam was in very good condition. It has an excellent turf cover on the slopes and a cemented stone paved walk-way on top. The toe area was okay.

The spillway structure is in good condition, it was operating and water level was at spillway crest elevation.

This dam is very well maintained and, in the opinion of the undersigned, was safe.

N. Florek Dam

This dam is in about the same condition as last reported. The vertical shaft concrete spillway pipe is in place and the concrete spillway pipe through the embankment, built on a cradle, is in place. The small drawdown pipe extending up into the area where the pond will be formed has been installed together with an entrance head wall. The brook still passes through the dam site in its original valley. Only a part of the embankment at and to the left of the spillway shaft has been placed.

Mr. Florek informed the undersigned that he does not know when, and if, he will finish the dam.

Conditions as existing are satisfactory.

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O. Pieczarka Realty Inc. Dam (now J. G. Kulper)

This dam is no longer active. As reported in the past, the dam was very poorly constructed and was not large enough to come within County jurisdiction. It was inspected periodically since it was located adjacent to State Highway Route 20.

The embankment has been breached and the old concrete spillway has been broken up and pulled out of the embankment. Thus, no pond is formed and the brook flows through a wide and deep breach in the embankment at the old spillway location.

P. Arm Brook Dam

This dam was inspected on Friday morning, May 23rd, in the presence of representatives of the Soil Conservation Service, and a representative of the Massachusetts Water Resources Commission. A report on the conditions noted at this dam was submitted to your Honorable Board on May 29, 1969. Consequently, there is no need to repeat the report herein, and I refer your Board to the comments made in the previous report. A copy of the report was sent to the Mayor of Westfield by your Board on June 4, 1969.

When the undersigned reinspected the dam on November 19th, it was noted that none of the recommendations of the previous letter had been complied with.

In the opinion of the undersigned, the dam is safe. However, the recommended maintenance work should be done.

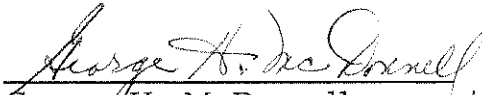
Q. Powder Mill Brook Dam

As in the case of the Arm Brook Dam, the Powder Mill Brook Dam was inspected on May 23rd, in the presence of a representative of the Soil Conservation Service and a representative of the Massachusetts Water Resources Commission. A report dated May 29, 1969 relative to the condition of the dam was submitted to your Board and your Honorable Board forwarded a report to the Mayor of Westfield in a letter dated June 4, 1969.

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& BOND** CONSULTING ENGINEERS

When Powder Mill Brook Dam was inspected by the undersigned on November 19th, it was observed that none of the recommendations previously made in regard to maintenance and improvements had been followed.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/jh

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
May 26, 1970

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

On Tuesday morning, May 12th, the undersigned met with representatives of the Soil Conservation Service, representatives of the Mass. Water Resources Commission, representatives of the Soil District and representatives of the City of Westfield for the annual inspection of the Arm Brook Multiple Purpose Dam and the Powder Mill Brook flood control dam in the City of Westfield. My report on the general conditions noted at each of these two dams is as follows:

Arm Brook Multiple Purpose Dam

Conditions at the dam embankment have improved some since the time of the last inspection. Some work is needed on the turf cover, particularly in areas that are relatively bare, and soft sandy surfaces. Treatment of these areas with some loam, seed and fertilizer will improve the embankment cover.

The turf on the flood flow spillway is poor. Much of the area of the flood flow spillway contains dead grass, and this is quite matted. An effort should be made to try and improve the turf on the flood flow spillway, particularly at the crest area and downstream thereof.

On the left bank of the stream valley at the lower end of the berm ditch about opposite the stilling basin structure of the principal spillway, erosion has extended further and corrective action must

be taken before further damage is done. At the time of the inspection, it was recommended that a side inlet type of structure be constructed and a corrugated iron pipe carry the surface runoff thru the area which is now subject to erosion. Another solution to the problem would be to fill in the eroded area, construct a corrugated iron pipe drain and install, on the upstream end of the drain, a scoop-type inlet. This would naturally require construction and grading in such a way as to direct the surface runoff into the scoop inlet of the corrugated iron pipeline.

The observation well downstream and to the right of the outlet facility and stilling basin has a solid iron cap on top of the well pipe. As recommended in previous years, this solid cap should be replaced with either a heavy screen or the solid cap should be drilled with small holes.

The brook valley downstream of the dam embankment was inspected and no seepage of any consequence was noted. There was no evidence in the bed of the stream to indicate subsurface water emerging in the stream bed.

The discharge end of the flood flow spillway is unstable and there has been some earth movement along with erosion. Whenever the flood flow spillway does operate, it can be expected that there will be serious damage to the downstream end of the flood flow spillway. Consideration should be given to the construction of an erosion control structure that will stabilize the end of the spillway and will prevent any serious erosion, gulying or loss of soil when the flood flow spillway goes into operation. The department or persons responsible for maintenance and construction at the dam to correct a condition such as this should prepare a design for a soil erosion control facility, submit the design to the County for approval and then funds should be provided for the construction of the facility.

The upstream end of the flood flow spillway is quite soft and wet. However, this condition is not serious and the undersigned does not consider that any maintenance or repair work is needed in this area.

There is some surface erosion at the left side of the dam embankment along the downstream toe as the toe blends with the left valley side. This erosion should be watched and corrective action taken.

Powder Mill Brook Dam

The road leading onto and across the upstream embankment berm should be closed and traffic prevented from driving onto any and all portions of the dam embankment. A good growth of sod should be developed and all existing erosion controlled.

A proper fence or suitable barriers should be installed to keep traffic off of the embankment area.

The embankment itself is in fairly good condition, and it was noted that the growth of the grass and sod has improved a great deal during the past year.

All logs and debris in the pond upstream of the dam embankment and on the shore areas of the pond across from the dam should be cleaned up and disposed of.

Logs, junk and debris should be removed from the inlet to the spillway pipe thru the embankment.

The manhole cover is missing from the top of the spillway pipe inlet. It should be replaced with a locking type manhole cover whereby the cover cannot be removed and disposed of by vandals.

Brush and small tree growth observed at the entrance of the flood flow spillway should be cut down and removed.

Wherever the sod cover is thin or poor, the areas involved should be improved by loaming, fertilizing and seeding.

An examination of the spillway pipe from the discharge end indicates that the pipe is on line and grade. The receiving stream channel just below the spillway pipe discharge end was noted to be satisfactory.


The upstream joint on the last pipe of the principal spillway is still in need of repairs. The need for caulking and sealing this joint was pointed out at previous inspections and has been previously reported. Still nothing has been done to repair the pipe joint.

TIGHE
& BOND CONSULTING ENGINEERS

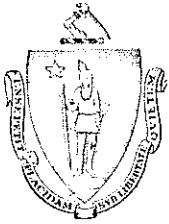
-4-

It is recommended that the City of Westfield be advised of the conditions that exist at the two dams reported herein and the City be directed to take the necessary steps to correct the undesirable conditions noted.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd



Commonwealth of Massachusetts
County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

~~William F. Stapleton~~

Floyd M. Bradet

Stephen A. Moynahan

May 27, 1970

The Honorable John J. Palczynski
Mayor of Westfield
Municipal Office Building
Westfield, Massachusetts

Re: Arm Brook and
Powder Mill Brook Dams

Dear Mayor Palczynski:

The annual inspection of the two above subject dams was conducted on Tuesday, May 12, 1970. The report of the County Hydraulic Engineer has been submitted to our Board and in order that you may be aware of the required maintenance and repair work needed at the two dams, his report is set forth hereinafter as follows:

Arm Brook Multiple Purpose Dam

"Conditions at the dam embankment have improved some since the time of the last inspection. Some work is needed on the turf cover, particularly in areas that are relatively bare, and soft sandy surfaces. Treatment of these areas with some loam, seed and fertilizer will improve the embankment cover.

The turf on the flood flow spillway is poor. Much of the area of the flood flow spillway contains dead grass, and this is quite matted. An effort should be made to try and improve the turf on the flood flow spillway, particularly at the crest area and downstream thereof.

On the left bank of the stream valley at the lower end of the berm ditch about opposite the stilling basin structure of the principal spillway, erosion has extended further and corrective action must be taken before further damage is done. At the time of the inspection, it was recommended that a side inlet type of structure be constructed and a corrugated iron pipe carry the surface runoff thru the area which is now subject to erosion. Another solution to

the problem would be to fill in the eroded area, construct a corrugated iron pipe drain and install, on the upstream end of the drain, a scoop-type inlet. This would naturally require construction and grading in such a way as to direct the surface runoff into the scoop inlet of the corrugated iron pipeline.

The observation well downstream and to the right of the outlet facility and stilling basin has a solid iron cap on top of the well pipe. As recommended in previous years, this solid cap should be replaced with either a heavy screen or the solid cap should be drilled with small holes.

The brook valley downstream of the dam embankment was inspected and no seepage of any consequence was noted. There was no evidence in the bed of the stream to indicate subsurface water emerging in the stream bed.

The discharge end of the flood flow spillway is unstable and there has been some earth movement along with erosion. Whenever the flood flow spillway does operate, it can be expected that there will be serious damage to the downstream end of the flood flow spillway. Consideration should be given to the construction of an erosion control structure that will stabilize the end of the spillway and will prevent any serious erosion, gulying or loss of soil when the flood flow spillway goes into operation. The department or persons responsible for maintenance and construction at the dam to correct a condition such as this should prepare a design for a soil erosion control facility, submit the design to the County for approval and then funds should be provided for the construction of the facility.

The upstream end of the flood flow spillway is quite soft and wet. However, this condition is not serious and the undersigned does not consider that any maintenance or repair work is needed in this area.

There is some surface erosion at the left side of the dam embankment along the downstream toe as the toe blends with the left valley side. This erosion should be watched and corrective action taken."

Powder Mill Brook Dam

"The road leading onto and across the upstream embankment berm should be closed and traffic prevented from driving onto any and all portions of the dam embankment. A good growth of sod should be developed and all existing erosion controlled.

A proper fence or suitable barriers should be installed to keep traffic off of the embankment area.

The embankment itself is in fairly good condition, and it was noted that the growth of the grass and sod has improved a great deal during the past year.

All logs and debris in the pond upstream of the dam embankment and on the shore areas of the pond across from the dam should be cleaned up and disposed of.

Logs, junk and debris should be removed from the inlet to the spillway pipe thru the embankment.

The manhole cover is missing from the top of the spillway pipe inlet. It should be replaced with a locking type manhole cover whereby the cover cannot be removed and disposed of by vandals.

Brush and small tree growth observed at the entrance of the flood flow spillway should be cut down and removed.

Wherever the sod cover is thin or poor, the areas involved should be improved by loaming, fertilizing and seeding.

An examination of the spillway pipe from the discharge end indicates that the pipe is on line and grade. The receiving stream channel just below the spillway pipe discharge end was noted to be satisfactory.

The upstream joint on the last pipe of the principal spillway is still in need of repairs. The need for caulking and sealing this joint was pointed out at previous inspections and has been previously reported. Still nothing has been done to repair the pipe joint.

It is recommended that the City of Westfield be advised of the conditions that exist at the two dams reported herein and the City be directed to take the necessary steps to correct the undesirable conditions noted. "

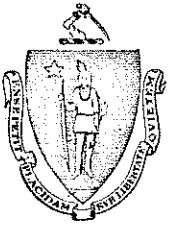
It is essential that these two dams be properly maintained and that recommended repairs and maintenance be done during the present year if at all possible. You will note that some of the recommendations contained in the report of this year are exactly the same as some of those contained in last

year's report. The two dams and the related storage areas represent a major investment for flood control purposes and they must be maintained if they are to serve their intended purpose. Minor repairs made now will undoubtedly prevent the need for more extensive and thus more expensive repairs at a later date.

If you have any questions in connection with the report, please call or write our Board.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
~~XXXXX~~

~~Ralph P. Bask~~

Floyd M. Fradet

Stephen A. Moynahan
Chairman

August 19, 1970

Board of Water Commissioners
Westfield Water Department
Municipal Building
Westfield, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition, and safety of the dams of Hampden County, you are hereby advised that all of your dams in Granville have been recently inspected by our Engineer. The dams were found to be safe and, conditions at Granville Reservoir Dam were the best noted by the County Hydraulic Engineer in many years. Personnel assigned to maintaining this dam are doing a very good job on the embankment and the surface drainage system.

The report of the County Hydraulic Engineer does point out the need for certain maintenance at the Winchell and the Japhet Dam. His report in connection with these two dams is self-explanatory and reported as follows:

"Winchell Dam Vegetation growing from the joints of the stone masonry should be removed and regrowth discouraged. If the vegetation is allowed to grow and roots become extensive and large, the stone block joints will be damaged and the cement grout will be displaced. Open joints of the block masonry will then be subject to alternate freezing and thawing in the winter time with eventual damage to the stone masonry.

Particular attention should be given to both sides of the dam and the area at the gate house.

The spillway was noted to be in fairly good condition. There were no flashboards on the spillway crest and water level in storage was at crest elevation. Some water was overflowing the spillway.

Japhet Dam The stone masonry is in good condition but all vegetation growing from joints in the masonry should be removed and regrowth discouraged. Continued growth of vegetation will dislodge the jointing material and result in damage to the masonry as described in the case of the Winchell Dam hereinbefore.

The spillway was in good condition. No flashboards were on the crest and the water level in storage was flowing over the crest.

The toe area of the dam was o.k. No erosion was noted at the toe in the brook.

Proper maintenance of these two stone masonry dams will prevent damage to the masonry joints. Vegetation growing from joints will displace the jointing material, will cause block movement and eventually will lead to additional damage as a result of alternate freezing and thawing in the open joints during the winter time.

By eliminating the growth of vegetation from the block masonry joints, you will prevent the possible need for extensive maintenance at a later date.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Westfield
June 11, 1970

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

All of the dams located within the City of Westfield have now been inspected at least once during the year 1970. The following is a report on the conditions noted at each dam within the City of Westfield.

A. Horse Pond Dam - Westfield Board of Water Commissioners

The embankment forming this small dam was noted to be in fair condition. There is some small amount of brush growth on the surface of the embankment, and this should be cut down. The surface of the embankment should be covered with a good growth of turf.

At the right side of the spillway, there is a small area where turf and loam have been dug out of the embankment. The area should be repaired with compacted earth, and then loamed and seeded. Though the hole is small at the present time, it may become enlarged through erosion if it is not repaired.

The toe area of the small embankment was o.k.

The stone masonry spillway was found to be in satisfactory condition and water was overflowing the stoplogs. Water level was about 4" above the top of the upper stoplog, which in itself was at a grade just below the level of the side stone shelf. The water level in storage was observed to be 2" above the elevation of the right stone shelf of the spillway. The spillway opening is 48" in width.

The spillway channel at and downstream of the dam was satisfactory.

In the opinion of the undersigned, this dam is in satisfactory condition and is safe but needs attention and maintenance as noted hereinbefore.

B. Chapin Pond Dam - Westfield Board of Water Commissioners

The dam embankment was noted to be in fair condition. It is anticipated that brush growth will be quite heavy by summer-time, and it should be cut down. A good turf cover should be developed on the downstream slope of the embankment and along the road shoulders at the top of the embankment.

The surface of the upstream slope needs to be repaired and graded at the area about opposite the large oak tree growing from the embankment.

The large oak tree itself should be cut down and the root system killed. Five other trees growing from the embankment and at the toe of the embankment should be cut down.

The spillway channel was found to be free of debris and was operating. The decking of the bridge over the spillway is becoming poor. New and proper abutments should be provided for the spillway bridge.

The irrigation suction pipe thru the embankment at the right end has been capped and was noted to be o. k.

The downstream toe of the embankment was found to be in satisfactory condition. It was a bit wet but the water was not moving.

The outlet end of the drainpipe thru the embankment was found to be in satisfactory condition.

In the opinion of the undersigned, maintenance work is necessary, as pointed out in the report, in order to keep the dam safe and in proper condition. The trees should be cut down, a good growth of turf should be developed, particularly on the downstream slope, and recommended repairs to the spillway bridge be made.

C. Westfield Sportsmen's Club Dam

The embankment forming this dam is in fair condition as to size and shape. The upstream surface is satisfactory. On the downstream surface, all brush growth should be cut down to ground level and a good growth of sod should be developed on the entire downstream face of the embankment.

The toe area is quite wet but, this condition is normal at this dam.

Water level in storage was at the crest of the spillway and was overflowing.

No flashboards were on the crest. Both swinging bar racks were found to be in satisfactory condition.

The road across the top of the embankment and the spillway bridge were satisfactory. Minor erosion of the concrete grouted rock spillway should be repaired this year. Repairs made now will be relatively inexpensive and will prevent the need for more expensive repairs at a later date.

The owner of this dam should be directed to remove all brush growth from the downstream surface of the embankment and at the toe of the embankment.

In the opinion of the undersigned, the dam is safe, but the recommended maintenance work is necessary.

D. Tekoa Dam - Westfield Board of Water Commissioners

This stone masonry dam was found to be in satisfactory condition. Some seepage was noted thru the face of the spillway at the base of the dam in front of the gatehouse just above the paved toe drainage channel. The condition is satisfactory for now.

Some vegetation was observed to be growing from the face of the dam at joints in the stone masonry. This growth should be discouraged and the root system killed to prevent the roots from damaging the stone masonry.

Water level in storage was at the crest of the spillway channel section and was overflowing. The concrete spillway cap was noted to be in satisfactory condition.

No flashboards were on the spillway.

The dam abutment areas were found to be o.k.

In the opinion of the undersigned, the dam is safe. However, the owner should be advised of the need to discourage the growth of brush and vegetation from the masonry joints of this stone dam.

E. Stevens Paper Company - Lower Dam

The crest of this dam was found to be o.k. Very little erosion of concrete was observed. The ice breakers on the crest were o.k. No flashboards were on the crest.

Some slight erosion was noted in the concrete masonry of the right abutment at crest level. This condition is not serious.

The stone face at the left abutment, at about the crest level, shows evidence of joint erosion. Again, this condition is not serious at the present time.

The toe area of the dam, in the bed of the stream, was observed to be satisfactory.

Two power poles have been installed on the main dike at the left side of the dam; one adjacent to the spillway left abutment and the other out on the earth dike. Two guy wires have been attached to the abutment to support the pole adjacent to the abutment, and one guy with a deadman has been installed in the dike adjacent to the pole out on the dike. These poles carry power to the mill, and their presence on the dike does not affect the safety of the dam and dike.

The turf cover on the dike was noted to be in good condition.

The riprap paving on the river side of the sloping face of the dike was in satisfactory condition.

In the opinion of the undersigned, this dam is in satisfactory condition and is safe.

F. Stevens Paper Company - Upper Dam

The crest of this dam was noted to be in very good condition. Crest stones are on good grade and good alignment. No flashboards are on the crest except for one short section of flashboards at about the center of the dam.

The toe area in the stream was o.k. The sheet of water overflowing the crest lands on the toe stones of the dam foundation. The masonry face of the dam was observed to be in satisfactory condition. The left abutment was in good condition and the concrete flood flow training wall on top of the abutment was o.k.

The right stone masonry abutment was found to be in satisfactory condition.

In the opinion of the undersigned, this dam is in satisfactory condition and is safe.

G. Springfield Water Works Intake Dam

The masonry of this dam was in good condition. Both abutments were satisfactory. No flashboards are on the crest and water in storage was passing over the top of this overflow dam.

The water supply intake structure at the right abutment was o.k. The bar rack was in good condition.

The toe area in the stream bed appeared to be satisfactory.

There is some masonry spalling, but this is minor. At the time of inspection, a maintenance man was at the dam cleaning and painting the metal work.

H. West Parish Filter Dam #1 (Lower) Springfield Water Works

The embankment forming this dam was noted to be in fairly good condition. The stone paving on the upstream slope of the dam was o.k. On the downstream face of the embankment, the upper half of the embankment surface is becoming covered with small tree and brush growth. This growth should be cut down and a turf cover developed.

The toe area of the embankment was good. One large tree growing from the stone wall at the embankment toe, just above the discharge end of the spillway pipe, should be cut down. The root structure of this tree soon will begin to damage the stone masonry wall.

The spillway tube and overflow shaft were noted to be o.k.

The gravel road across the top of the dam embankment was in satisfactory condition. There were no settled areas or general depressions anywhere along the road.

The emergency spillway channel built around the right end of the dam was o.k. It is becoming filled with brush growth, but this growth is not bad enough as yet to require cutting. At the time of inspection, water level in storage was at the crest of the spillway shaft.

In the opinion of the undersigned, this small dam is safe, but it is in need of maintenance as recommended.

I. West Parish Filter Dam #2 (Middle) Springfield Water Works

The embankment is good as to shape and general condition. The paved roadway across the top of the dam embankment was noted to be in good condition. There were no cracks or settled areas.

The washed stone paving of the upstream slope was o.k. There is some brush growth on the dam surface, but it is not bad enough as yet to require cutting.

Tree growth on the downstream slope and along the downstream toe should be thinned out. The larger trees should be cut first. Root systems of these large trees may eventually work their way thru the embankment and be a source of trouble.

The spillway inlet shaft was o.k. The pipe outlet and the stream bed therefrom was in satisfactory condition.

In the opinion of the undersigned, this small dam is safe but is in need of maintenance as recommended.

J. West Parish Filter Dam #3 (Upper) Springfield Water Works

The spillway is in need of some attention. Concrete at the downstream toe of the spillway wall shows signs of erosion which should be corrected. Brush growth in the spillway channel between the spillway wall itself and the roadway bridge should be cut down and the channel kept clean.

The embankment itself is o.k. as to shape and general condition. On the day of inspection, maintenance personnel were cutting brush growth along the top of the embankment.

The water side slope surface rock paving was in satisfactory condition. The gravel road along the top of the dam embankment was in satisfactory condition.

The downstream face of the embankment was in fair condition. There are areas where grass growth is thin, and loam as well as seed could be placed on these areas. Many areas may only need seed and fertilizer.

One burrow hole was noted at the center of the downstream face of the embankment about half-way up from the toe. This burrow hole is easily found and it should be plugged.

The toe area of the embankment is dry.

On the day of inspection water level in storage was quite low. On the whole, the dam is in fairly good condition, but the recommended maintenance should be done this year.

K. Howard Smith Dam (now Westfield Y. M. C. A.)

The embankment of this small dam is in fairly good condition. All brush growth occurring on the top and on the downstream side of the dam embankment as well as along the toe of the dam embankment, should be cut down. A good grass turf should be developed in the areas where brush is now growing.

The toe area of the embankment is fairly dry.

The main spillway was o.k. and operating. Water in storage was at the crest of the spillway.

The flood flow spillway at the left of the embankment needs maintenance. All debris, the broken footbridge, logs, etc., should be cleaned out of the spillway channel.

L. Stanley Park Dam

The embankment of this small dam was in very good condition. It has a good turf cover. The cemented stone paved walkway along the top of the dam was in good condition.

The toe area of the embankment was o.k.

On the day of inspection, the spillway was functioning and the inlet to the spillway was clear of any debris. Water level in storage was at normal elevation.

M. Florek Dam

This dam is in the same condition as last reported. The owner is doing very little at this dam. The vertical shaft concrete spillway is in place and the concrete spillway pipe thru the embankment has been built on a cradle and is in place. The small drawdown pipe extending up into the area where the pond will be formed has been installed, together with an entrance headwall. The brook passes thru the dam site in its original valley. Only a part of the embankment at and to the left of the spillway shaft has been placed.

The undersigned was informed on the day of inspection that there is no planned schedule for completing the dam.

Conditions as existing are satisfactory.

N. Pieczarka Realty Inc. Dam (now J. G. Kulper)

As reported a year ago, this dam is no longer active. The area where the spillway originally was located has been completely dug out and the brook passes thru this section of the old embankment. No pond whatsoever is formed. The breach thru the old embankment is wide enough and deep enough to safely pass flood flows.

For all practical purposes, this dam has been abandoned and safely breached.

One more inspection will be made during 1971, and if conditions are still the same at that time, a recommendation will be made that the dam be dropped from the inspection routine.

O. Arm Brook Dam

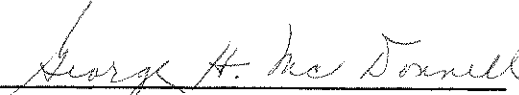
This dam was inspected on Tuesday, May 12th, in the presence of representatives of the Soil Conservation Service, Mass. Water Resources Commission, representatives of the City of Westfield and the local Soil District. A report on the conditions noted at this dam was submitted to your Honorable Board on May 26, 1970. Consequently, there is no need to repeat the report herein, and I refer your Board to the comments made in the previous report. A copy of the report was sent to the Mayor of Westfield on May 27, 1970.

In the opinion of the undersigned, the dam is in need of maintenance, and the City of Westfield should take the necessary steps to have the maintenance work done.

P. Powder Mill Brook Dam

As in the case of the Arm Brook Dam, the Powder Mill Brook Dam was inspected on Tuesday, May 12th, in the presence of the various officials who inspected the Arm Brook Dam earlier in the day. A report to your Honorable Board dated May 26, 1970 relative to conditions of the dam, contained recommendations for necessary maintenance. Your Board forwarded a copy of the report to the Mayor of Westfield in a letter dated May 27, 1970.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd

Westfield Dike - Map & Description - 1880

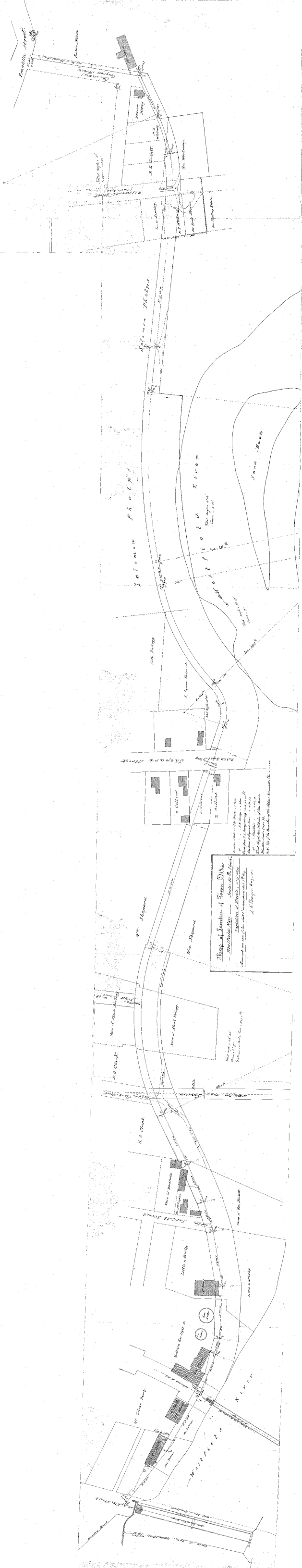


1880 Reports

Westfield Dike - 1880. Chapter 150 of the Acts of 1879.

City/Town

Westfield



Springfield Oct 23rd 1873,
(Received and Registered in Hampden
Registry of Deeds Book 308. Page 346
By James E. Raper Register)

— Description as a —
of certain Lands taken by the Town
— of Westfield —
— for Waterworks. —

Rec^d Oct 26th 1873
JER

Location of private crossings

To fix and determine the number of private crossings over and along said Dike, and the place and manner in which, and the persons by whom said crossings shall be constructed and hereafter maintained as follows

No 1 a right of way along the Dike from Elm Street to the easterly end of H O Clark's factory building on the south side of the dike about 110 feet from Elm Street, for the use of Mary Densen and H O Clark and their heirs and assigns and any other person having a right of way over the passage way leading from Elm Street on the northerly line of H O Clark's Elm Street lot and thence northerly to the dike, There is also granted to H O Clark the right to construct and maintain a platform or stairway, not exceeding 6 feet square on the northerly side and at the west end of the Johnson Organ factory, Should the said factory be moved to the south side of the dike, and located as shown on Tracing, the size and location of said platform being shown on said Tracing. filed herewith.

No 2 A right of way over said dike between station 2+50 and 3+80 to William Calnan, William Houde and H O Clark, their heirs and assigns, Said lease to have the right of crossing for the use of his Ice business.

called Congreg Street to a Stone monument on the
westerly line of said private way; The lands taken
on the south side from Station 45+2970 heretofore mentioned
to this point is 8 feet wide and on the north side 25 feet
wide ~ The line heretofore described is a base line
of Location the widths of lands taken are measured
at right angles to this line on the northerly and southerly
side as Specified ~ Thence south 24° west 342 feet
on said westerly line of private way to Franklin Street
The land taken lies wholly on the easterly side of said
line and is 12 feet wide ~ In addition to the land
heretofore described the following described tract
is hereby taken as a part of the land embraced
in this location commencing at a point in the
westerly line of Solomon Phelps lot and in the northerly
line of the location heretofore described and running
northerly on said Phelps line 100 feet to the northerly
line of a lot belonging to Emily Brown thence westerly
on Estate of George Mallory 127 feet to a private way
called Ellsworth Street thence across said Street on
the same course to land belonging to George Workman
thence southerly on said Workman 66 feet to the
northerly line of said location, thence easterly on
said location line to the place of beginning.

Lucius F. Thayer }
Daniel L. Lumberton } Special
Edward C. Carpenter } Commit.

The Town of Westfield in accordance with the authority given by an act of the Legislature of Massachusetts entitled "an act to supply the Town of Westfield with pure water" approved May 29 1873 and for the purposes named in the 1st and 3^d sections of said act have taken and do hereby take the following described land situate in Montgomery Hampden County Massachusetts. - said land lying southerly of the dwelling houses of Atwater Moore and Ockerby Moore and supposed to belong to Atwater Moore and Chelsea Upson. -

Commencing at a point in the easterly line of Highway from Montgomery to Westfield (which runs near the easterly side of Debra Mountain) and in the centre of a stone wall dividing mowing lot from pasture and southerly of the dwelling house owned by Atwater Moore, and running S 75° E along the centre of above mentioned wall 371 ft to the S.E. corner of said mowing lot. Thence N $1\frac{3}{4}^{\circ}$ E along the line of the

centre of wall on Easterly side of said
mowing lot 417 ft to Stake & Stones
50 ft Northerly of N.E. corner of said
mowing lot. Thence $N 30^{\circ} \frac{1}{4} E$ 594 ft
to Stake & Stones. Thence $N 20^{\circ} \frac{1}{4} W$
475 ft to Stake and Stones. Thence $N 28^{\circ} \frac{3}{4} E$
130 ft to Stake and Stones. Thence $S 63^{\circ} E$
364 ft to Stake and Stones in old wall
southerly of distillery. Thence $S 81^{\circ} \frac{1}{2} E$
651 ft to Stake and Stones. Thence $S 36^{\circ} \frac{1}{2} E$
273 ft to the corner of wall at the N.W.
corner of lot owned by Chelms Upson.
For the above courses and distances the
plot is bounded by land of Alwater Moore.
Thence from above mentioned corner along
the centre of the fence between Moore and
Upson $S 84^{\circ} \frac{1}{2} E$ 184 ft to Mill Privilege.
Thence along an irregular line, of fence
mill, and face of dam about 447 ft
to a Stake & Stone about 82 ft Easterly
of the Easterly side of mill, bounded
Northerly by said mill privilege.
Thence $S 13^{\circ} W$ on land of said Upson
637 ft to Stake & Stones. Thence $S 56^{\circ} \frac{1}{2} W$
on land of said Upson to Stake and
Stones in the fence between Moore and
Upson. Thence $N 80^{\circ} \frac{3}{4} W$ on land of

said Alwater Moore 690 ft to Stake and
Stone near apple tree. Thence $S 5^{\circ} \frac{1}{2} W$
on said Moore 506 ft to Stake and
Stone.

said Alwater Moore 690 ft to Stake and
Stone near apple tree. Thence $S 5\frac{1}{2}^{\circ} W$
on said Moore 506 ft to Stake and
Stones. Thence $S 30\frac{3}{4}^{\circ} W$ 215 ft on said
Moore to Stake and Stones about 50 ft
Easterly of Brook. Thence $S 88\frac{1}{2}^{\circ} W$ on
said Moore across Brook 205 ft to
a hole drilled in a large rock. Thence
on said Moore $N 35\frac{1}{2}^{\circ} W$ 208 ft
to a point marked by a hole drilled
in rock near marked tree. Thence
 $N 19\frac{1}{2}^{\circ} W$ 259 ft on said Moore to
a point marked by a hole drilled in rock
near marked tree. Thence $N 60\frac{1}{4}^{\circ} W$
on said Moore 192 ft to Stake and Stone
33 ft from S.E. corner of mowing lot
described in 1st course and in line with
2^d course. Thence $N 75^{\circ} W$ parallel
with the first course 371 ft on said Moore
to the Highway. Thence northerly on
Easterly line of Highway 33 ft to place
of beginning

containing 51 Acres 153 rods more or less

Also the following described land
lying ^{in said Montgomery} near Mount Zekoa and
supposed to belong to the Elisha
Gaylord Estate. -

Commencing at a Stone Monument
supposed to be in the Town line between
Westfield and Montgomery and 2 Rods
northerly and at Right angles to the direction
of the fence between Edward Bancroft
and the said Elisha Gaylord Estate
and running $N 5\frac{1}{4}^{\circ} W$ 847 ft on
said Estate to stake and stones
Thence $N 29\frac{3}{4}^{\circ} W$ 187 ft on said Estate to
Birch Tree (marked). about 1 Rod Easterly
of brook. Thence Northerly up the stream
on said Estate on a line one Rod
Easterly from brook and parallel with brook
about 60 Rods to the Easterly side of the
Highway. Thence Southerly on Easterly line
of Highway about 136 Rods to the N.W. corner
of land owned by Edward Bancroft. Thence
Easterly on the division line between said
Estate and said Bancroft about 43 Rods
to supposed Town line. Thence $N 43^{\circ} E$
about 2 Rods to place of beginning

The subscriber being a special committee duly chosen at a meeting of the inhabitants of the town of Westfield, specially called for that purpose under and in pursuance of Chapter 150 of the Acts of the year 1879 having caused to be published for two successive weeks, to wit: on the ninth and sixteenth days of ^{July} A.D. 1879 in the Western Hampden Times and News Letter a notice of the time and place at which we would meet to fix and determine the location of said dike, and hear all parties in relation to the same and fix and determine the number of private crossings, and the place and manner in which, and the persons by whom, such crossings shall be constructed and thereafter maintained, did meet and hear all said parties who chose to be heard thereon at the time and place specified in said notice, and having adjourned from time to time to this Twenty fourth day of January A.D. 1880 do now fix and determine the location of said dike under the provisions of said Chapter 150 as follows

Commencing at a point $34\frac{7}{10}$ feet southward
of the face of the back wall of the southward abutment
of Great River Bridge, said point is in a line with
the center line of said Bridge, thence north $37^{\circ}43'$ west
to westerly line of Elm street as laid by the County
Commissioners August 14th 1879 $34\frac{8}{10}$ feet (angle
 $67^{\circ}2'$ from the center line of Bridge and line last
described) thence same course $18\frac{5}{10}$ feet. the land
taken on the south side is 15 feet wide, the
westerly line being parallel with Elm street
thence same course $92\frac{6}{10}$ feet, the land taken
on the south side is 7 feet wide at the East
end and 27 feet wide at this point, said East
and west lines are parallel with Elm street
thence same course 20 feet the land taken on
the south side is 8 feet wide on the East end
and 6 feet wide at this point. The land taken
on the north side from Elm street to this point
embraces all the land to the Westfield River

Thence same course $48\frac{7}{8}$ feet on old dike and on land supposed to belong to H. O. Clark and Mrs. Denen to an iron monument at Station $2+14\frac{7}{8}$ as marked on the Tracing hereto annexed, Thence $7^{\circ}48'$ left North $45^{\circ}31'$ West 39 feet on the old dike and land supposed to belong to said Clark and Denen. The land taken on the South side runs from the width of 6 feet heretofore described to a width of $18\frac{1}{2}$ feet at this point, as shown on said Tracing, and on the North side all the land to the River - Thence same course $168\frac{7}{8}$ feet on old dike and lands supposed to belong to said Clark, Denen Right of way William Calnan Wiram Hull and New Haven + Northampton Co. to a point in the center of the New Haven + Northampton Co's main track $49\frac{9}{16}$ feet Southwesterly from the face of the south abutment at the level of the Bridge seat marked Station $4+22\frac{7}{8}$ as shown on said Tracing, The land taken on the South side runs from the width of $18\frac{1}{2}$ feet heretofore described to a width of 20 feet at this point, on the northerly side all the land to the Westfield River, Thence $8^{\circ}25'$ left North $53^{\circ}36'$ West $21\frac{7}{8}$ feet on land of New Haven + Northampton Co, The land taken on the South side runs from the width of 20 feet heretofore described to a width of 15 feet at this point. on the north side the width is 60 feet, Thence same course $45\frac{7}{8}$ feet on land of New Haven + Northampton Co and Westfield Gas Light Co and Old Dike -

The land taken on the South side runs from the width of 15 feet heretofore described to a width of 11 feet at this point, thence same course 70 $\frac{1}{2}$ feet on old dike and land of ^{said} Gaslee to an Iron monument, The land taken on the South side runs from the width of 11 feet heretofore described to a width of 19 feet at this point, thence 8 $^{\circ}$ 48' left North 62 $^{\circ}$ 44' west 51 $\frac{1}{2}$ feet on said Gaslee and old dike to an Iron monument, The land taken on the South side runs from the width of 19 feet heretofore described to a width of 14 feet at this point, thence 9 $^{\circ}$ 25' left North 72 $^{\circ}$ 09' west 167 $\frac{1}{2}$ feet on said old dike and land of said Gaslee and Little & Gridley to an Iron monument opposite said Little & Gridley's Ice House, The land taken on the South side runs from the width of 14 feet heretofore described to a width of 22 feet at this point, The land taken on the north side of the ^{line} heretofore described, from the center of the New Haven & Northampton Co's main Tract to the last-described point is 60 feet wide, thence 12 $^{\circ}$ 30' left North 84 $^{\circ}$ 39' west 176 $\frac{1}{2}$ feet over old dike and land of said Little & Gridley and Sackett Street to an Iron monument, ^{thence} 7 $^{\circ}$ 58' left South 87 $^{\circ}$ 23' west 99 feet over old dike and land supposed to belong to the heirs of George Sackett, Sackett Street so called and Thomas McLaughlin to an Iron monument, thence 3 $^{\circ}$ 54' left South 81 $^{\circ}$ 29' west 127 $\frac{3}{4}$ feet over old dike and land supposed to ^{belong to} said heirs of George Sackett said McLaughlin Town of Westfield and John Dibble to an Iron monument

Thence $2^{\circ}24'$ left. south $79^{\circ}05'$ 176 feet over old dike and lands supposed to belong to said Dibble, To Clark and Town of Westfield to an iron monument at Station $13+58\frac{1}{2}$ at the beginning of a curve to the right as shown on tracing huts annexed, Thence by an $8^{\circ}17'$ curve (Radius $692\frac{1}{2}$ feet) to the right - 547 feet. (Total angle $45^{\circ}20'$) over old dike said Clark. Clark Street Town of Westfield John Dibble Lewis of Abiah Kellogg and William Shepard to an iron monument at Station $19+04\frac{1}{2}$. Point-Tangent. The width of land taken on the South side from the monument heretofore described opposite Little Bradley's Ice House to the last named point is 22 feet wide, the land taken on the north side from said point at Ice House to said last-named point is 60 feet wide, Thence on Tangent to said curve North $55^{\circ}35'$ West $413\frac{1}{2}$ feet over old dike and lands of said Shepard to land of T. J. Collins, the land taken on the South side from last described point at end of curve to this point is 18 feet wide and on the north side 50 feet wide. Thence same course on old dike and said Collins 168 feet. The land taken on the South side is 18 feet wide and on the north runs from a width of 50 feet at east-line of said Collins to a width of 15 feet at this point, Thence same course $9\frac{1}{2}$ feet over old dike and said Collins to Shepard Street. The land taken on the South side is 18 feet wide and on the north side from the last named point - the width is 15 feet; Thence same course $148\frac{1}{2}$ feet over old dike. Shepard Street and land supposed to belong to J. Lyman Shepard to an iron monument at the beginning of a curve to the left at Station $26+45$ as shown on tracing

thence by a curve to the left; of $133\frac{3}{4}$ feet Radius, over old dike and land supposed to belong to said Shepard 144 feet to an Iron monument at Station 27+89. point of reverse curve (The total angle is $61^{\circ}50'$ the distance measured on chord is 137 $\frac{3}{4}$ feet) thence by a 9° curve to the right, Radius $637\frac{3}{4}$ feet, 359 feet, (Total angle $32^{\circ}19'$) on land supposed to belong to said Shepard and Solomon Phelps to an Iron monument, thence on a Tangent to said curve $85.06'$ west on land of said Phelps 75 feet to an Iron monument at the beginning of a curve to the right at Station 32+23, thence by a $3^{\circ}24'$ curve to the right (Total angle $18^{\circ}22'$, on said Phelps 540 feet to an Iron monument at Station 37+63, the land taken on the South side from the eas line of Shepard Street to the last point is 20 feet wide and on the North side 100 feet wide, thence by a Tangent Course North $66^{\circ}44'$ west 616 $\frac{7}{10}$ feet on land of said Phelps James Barkley and M B Whitney to an Iron monument at Station 43+79 $\frac{7}{10}$ thence by a $10^{\circ}43'$ curve to the left (Radius 535 $\frac{5}{8}$ feet) 150 feet on land of said Whitney a private way called Ellsworth Street, George Workman and Dr. Gillett to Station 45+29 $\frac{7}{10}$, the land taken on the South side of Station 37+63 before mentioned to this point is 20 feet wide and on the North side 25 feet wide, thence by the same curve 130 feet over lands of said Gillett, Whitney, Workman and Dennis Murphy to an Iron monument (Total angle 30°) thence on a Tangent North $83^{\circ}20'$ 150 feet on land of said Murphy and a private way

Also a strip of land situate in Westfield
in said County and described as follows
Commencing at the stone monument
described at the beginning of the above
description and running Easterly on a line
33 ft from a line between said Estate and
Bancroft and parallel thereto about
15 rods to the westerly line of the Highway
Thence Southerly about 2 rods on Highway
to said division line. Thence Westerly
on said division line about 15 Rods
to supposed Town line. Thence N 43° E
about 2 rods to place of beginning

containing a total area in the two
last described pieces of land of 17 Acres
more or less

Variation of the Needle 8° 54' West.

Lewis H. Root Esq.

Rayben North	} Water Commissioners For the Town of Westfield
Saml. Horton	
Wm Stiles Bush	
Lewis R. Norton	

Westfield Water Works - Montgomery Supply - 1905



1905 Reports

Description of lands taken & location maps Westfield Water Works Montgomery Supply 1905.

City/Town	Montgomery
City/Town	Westfield
Name	Hall, Eunice D
Name	Williams, C A
Name	Allyn, Walter D
Name	Hallbourg, Frank
Name	Perkins, Lucy W
Name	Bargfrede, Anna C S
Name	Hall, Andrew J
Name	Moore, Ocenius E
Name	Kelso, Charles R
Name	Moore, Wilbert T
Name	Moore, Clifford O
Name	Pittsinger, Adelaide
Streets	Tekoa Road
Streets	Pitcher Street
Streets	Moore Hill Road
Streets	Russell Road

Water

Pochassic Brook

Water

Moose Meadow Pond

DESCRIPTION
OF
LANDS TAKEN
AND
LOCATION MAPS
WESTFIELD
WATER WORKS
MONTGOMERY
SUPPLY
1905

499

HAMPDEN COUNTY REGISTRY OF DEEDS.

JAN 16 1906

Received 10 H. 55 M. a.m.

James C. Wells Reg.

WESTFIELD-WATER-WORKS
 Montgomery Supply
 MAP OF LAND TAKEN
 - Anna C. S. Bargfrede -
 - SCALE: 1 INCH = 200 FEET -
 - OREN E. PARKS - C. E. -
 - 1905 -

Clifford Moore

Clifford Moore

TRACT 2,
 28.94 A.

N. 89° 49' 30" W.
 1126.5

S. 89° 41' E.
 900.0
 Modern

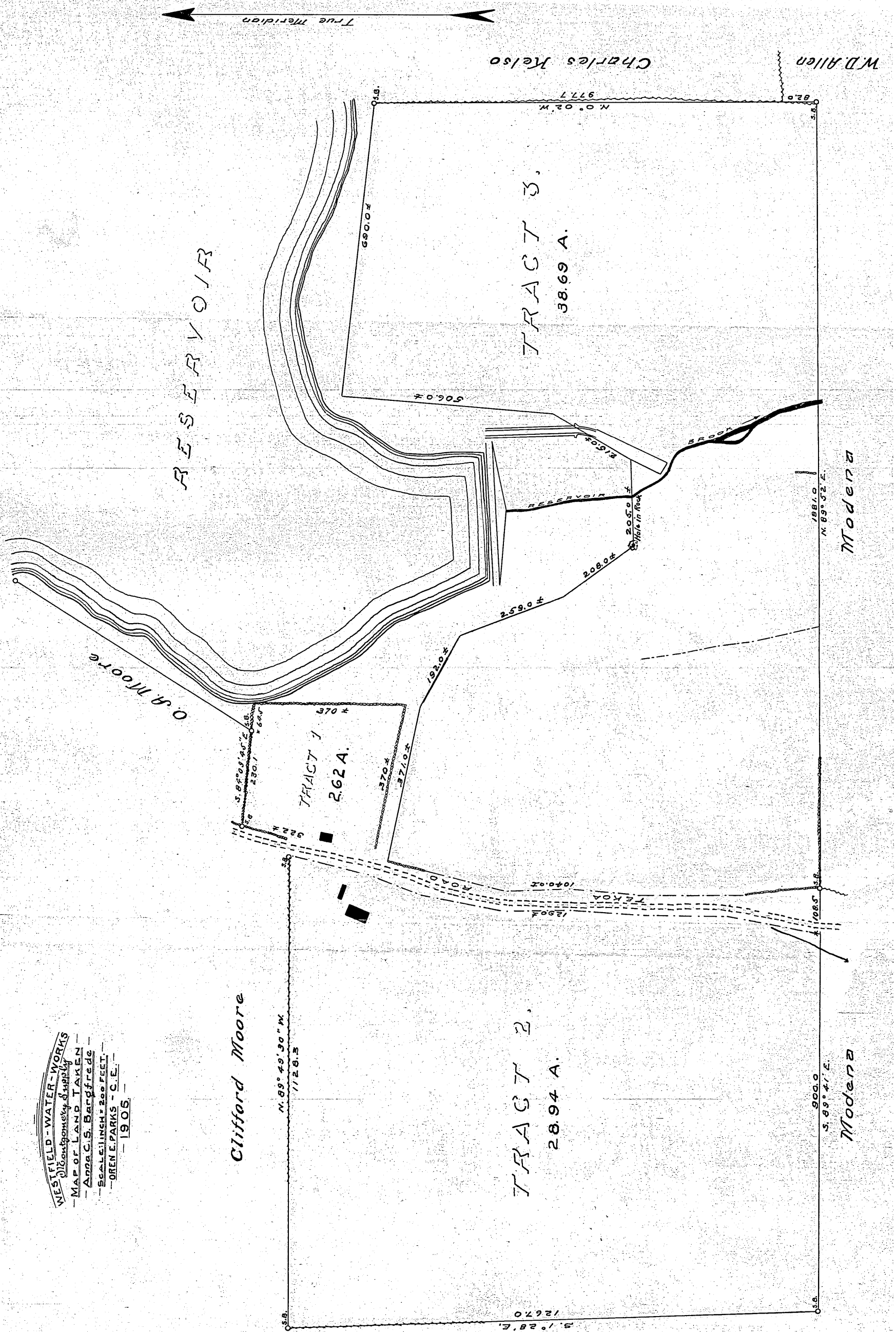
RESERVOIR

TRACT 3,
 38.69 A.

Charles Kelso

W.D. Allen

Modern



KNOW ALL MEN,

That the Town of Westfield, in accordance with the authority given by an Act of the Legislature of Massachusetts entitled "An Act to Supply the Town of Westfield with Pure Water", approved May 29th., 1873 and for the purposes named in the 1st. and 3rd. sections of said act, have taken and do hereby take the following described land situated in Montgomery, Hampden County, Massachusetts, and supposed to belong to Anna C. S. Bargfrede:-

Tract #1. Commencing at a stone monument on the easterly side of the highway and in the division line between land of O. A. Moore and land of said Bargfrede, thence South $84^{\circ} 09' 45''$ East along land of said Moore two hundred thirty and one tenth (230.1) feet to a stone monument at land of Town of Westfield, thence same course along land of Town of Westfield about sixty-four and five tenths (64.5) feet, thence southerly along land of said Westfield about three hundred seventy (370.) feet, thence westerly along land of said Westfield about three hundred seventy (370.) feet to the highway, thence northerly along the highway about three hundred twenty-two (322.) feet to the place of beginning, containing about 2.62 acres.

Tract #2. Commencing at a stone monument on the westerly side of the highway and in the division line between land of Clifford Moore and land of said Bargfrede, said monument bearing South $33^{\circ} 43' 45''$ West one hundred thirty-three and four tenths (133.4) feet from the first mentioned monument in the description of tract #1, thence North $89^{\circ} 49' 30''$ West along land of said Moore eleven hundred twenty-eight and three tenths (1128.3) feet to a stone monument, thence South $1^{\circ} 28'$ East along land of said Clifford Moore twelve hundred sixty-seven (1267.) feet to a stone monument at land of one Modena, thence South $89^{\circ} 41'$ East along land of said Modena about nine hundred (900.) feet to a point on the westerly side of the highway, said point bearing North $89^{\circ} 41'$ West one hundred eight and five tenths (108.5) feet from a stone monument on the easterly side of the highway at the commencement of the description of tract #3, thence northerly along the highway about twelve hundred ninety (1290.) feet to place of beginning, containing about 28.94 acres.

Tract #3. Commencing at a stone monument on the easterly side of the highway and in the division line between land supposed to belong to one Modena and land of said Bargfrede, thence North $89^{\circ} 52'$ East along land of said Modena eighteen hundred eighty-one (1881.) feet to a stone monument at land supposed to belong to W. D. Allen, thence North $0^{\circ} 02'$ West along land of said Allen about eighty-two (82.) feet to land supposed to belong to Chas. Kelso, thence same course along land of said Kelso nine hundred seventy-seven and seven tenths (977.7) feet to a stone monument at land of Town of Westfield, thence westerly along land of said Westfield about six hundred ninety (690) feet, thence southerly along land of said Westfield about five hundred six (506) feet, thence south-westerly along land of said Westfield about two hundred fifteen (215) feet, thence westerly about two hundred five (205) feet, to a hole drilled in a large rock, thence north-westerly along land of said Westfield about two hundred eight (208) feet, thence north-westerly along land of said Westfield about two hundred fifty-nine (259) feet, thence north-westerly along land of said Westfield about one hundred ninety-two (192) feet, thence westerly along land of said Westfield about three hundred seventy-one (371) feet to the highway, thence southerly along the highway about ten hundred forty (1040) feet to the place of beginning, containing about 38.69 acres.

Said Town of Westfield, by its Board of Water Commissioners, Sumner W. Hildreth, F. S. Dewey Jr. and J. Horton Packard, for the purposes aforesaid have taken all the rights to the above described tracts of land.

In witness whereof, we, the said Sumner W. Hildreth, F. S. Dewey Jr. and J. Horton Packard, have hereunto set our hands this twenty-eighth day of November in the year of our Lord, one thousand nine hundred and five.

(Signed)

Sumner W. Hildreth.....)*James Horton Packard*.....)*Frank S. Dewey Jr*.....)

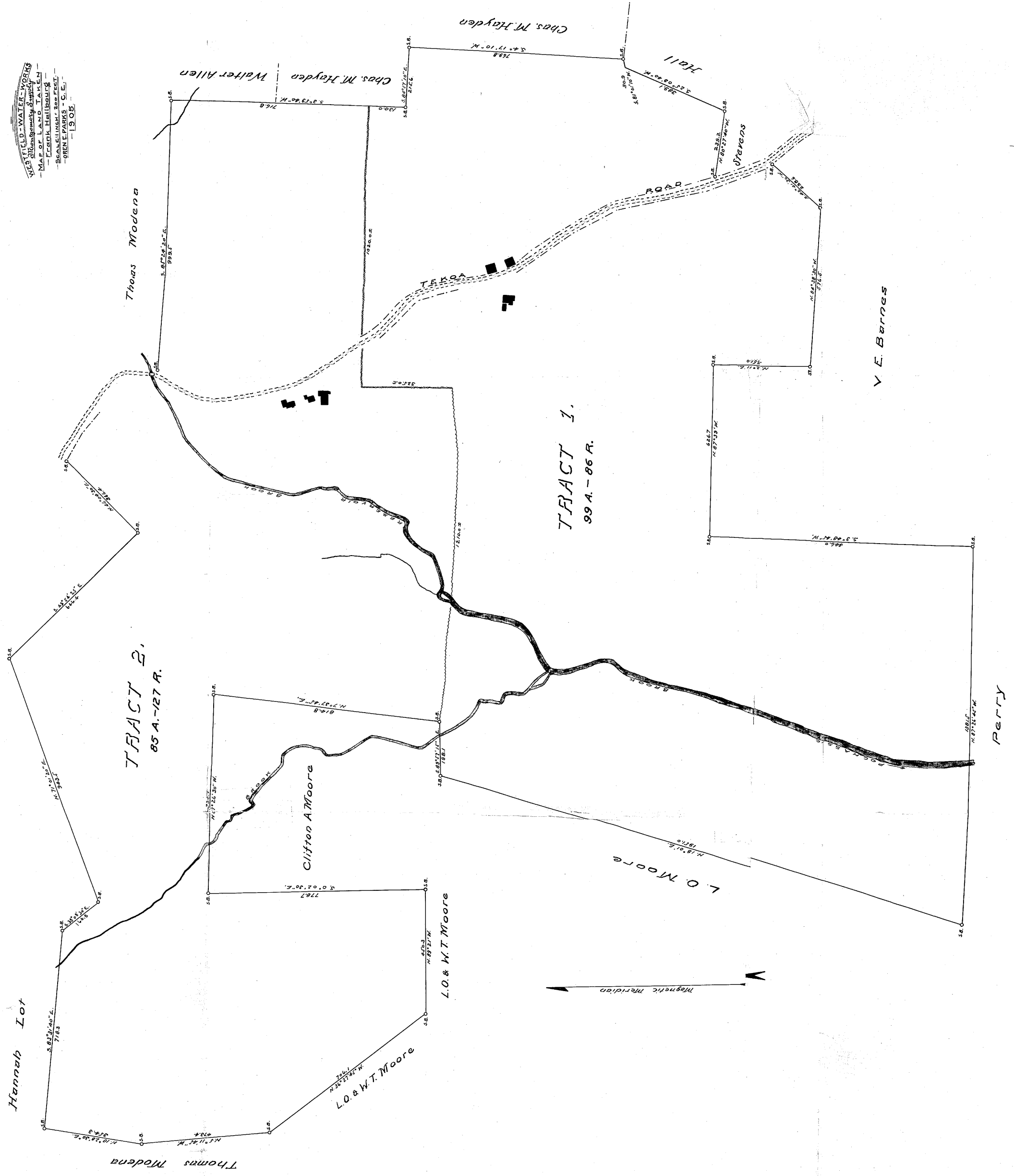
Board of Water

Commissioners.

In the presence of

Orin E. Parks.....

Handah Lot



KNOW ALL MEN,

That the Town of Westfield, in accordance with the authority given by an Act of the Legislature of Massachusetts entitled "An Act to Supply the Town of Westfield with Pure Water", approved May 29th., 1873 and for the purposes named in the 1st. and 3rd. sections of said act, have taken and do hereby take the following described land situated in Montgomery, Hampden County, Massachusetts, and supposed to belong to Frank Hallbourg.

Tract #1. Commencing at a stone monument on the westerly side of the Tekoa Road, so called, in the division line between land of said Hallbourg and land supposed to belong to V. E. Barnes, thence South $42^{\circ} 41' 30''$ West about two hundred thirty-eight and six tenths (238.6) feet to a stone monument, thence North $84^{\circ} 38' 30''$ West about five hundred seventy-six and five tenths (576.5) feet to a stone monument, thence North $2^{\circ} 11'$ East about three hundred fifty-one (351.0) feet to stone monument, thence North $87^{\circ} 39'$ West about six hundred twenty-six and seven tenths (626.7) feet to a stone monument, thence South $3^{\circ} 48' 45''$ West about nine hundred forty-six (946.0) feet to a stone monument at land supposed to belong to one Perry; the five preceeding courses are along land supposed to belong to said V. E. Barnes, thence North $87^{\circ} 26' 45''$ West along land of said Perry about thirteen hundred eighty-one and five tenths (1381.5) feet to a stone monument at land supposed to belong to L. O. Moore, thence North $18^{\circ} 01'$ East along land of said Moore about nineteen hundred fifty-one (1951.0) feet to a stone monument at land supposed to belong to Clifton A. Moore, thence South $89^{\circ} 57' 15''$ East along land of said Moore about one hundred ninety-eight and one tenth (198.1) feet to a stone monument at land of Frank Hallbourg, formerly of Fitzhugh Hoag, thence easterly along land formerly of said Hoag about twelve hundred ten (1210.0) feet, thence northerly along land formerly of said Hoag about three hundred twenty-five (325.0) feet, thence easterly crossing the Tekoa Road about ten hundred twenty (1020.0) feet to land supposed to belong to Chas. M. Hayden, thence South $3^{\circ} 59' 40''$ West about one hundred thirty (130.0) feet to a stone monument, thence South $84^{\circ} 57' 10''$ East about two hundred fifteen and six tenths (215.6) feet to a stone monument, thence South $4^{\circ} 17' 10''$ West about seven hundred sixty-nine and eight tenths (769.8) feet to a stone monument at land supposed to belong to one Hall: the last three courses are along land of Chas. M. Hayden, thence South $81^{\circ} 01' 10''$ West along land of said Hall about thirty and nine tenths (30.9) feet, thence South $25^{\circ} 09' 4''$ West along land of said Hall about three hundred eighty-nine and one tenth (389.1) feet to a stone monument, thence North $80^{\circ} 27' 40''$ West along land of Hall and land supposed to belong to one Steven about two hundred thirty-nine and two tenths (239.2) feet to a stone monument on the easterly side of the Tekoa Road: said monument bearing North $11^{\circ} 07' 30''$ West about two hundred fourteen and one tenth (214.1) feet from the first mentioned monument, thence southerly along the highway to the place of beginning. Containing about ninety-nine acres and eighty-six square rods (99 A. 86 R.) The foregoing described tract being what is known as the McGill Farm and decided to said Hallbourg by Michael and Sarah R. McGill June 20th., 1905 and recorded in Hampden County Registry of Deeds, Book 694, Page 209.

Tract #2. Commencing at a stone monument at the south-easterly corner of land supposed to belong to Clifton A. Moore and in the northerly line of tract #1, thence North $7^{\circ} 37' 45''$ East about eight hundred fourteen and eight tenths (814.8) feet to a stone monument, thence North $87^{\circ} 26' 30''$ West about seven hundred twenty-six and one tenth (726.1) feet to a stone monument, thence South $00^{\circ} 02' 30''$ East about seven hundred seventy-eight and seven tenths (778.7) feet to a stone monument at land supposed to belong to

L. O. & W. T. Moore; the three last courses are along land of C. A. Moore, thence North $89^{\circ} 21'$ West along land of L.O. & W.T. Moore about four hundred fifty and three tenths (450.3) feet to a stone monument, thence North $36^{\circ} 27' 45''$ West along land of L.O. & W.T. Moore and the "Unknown Lot", so called, about seven hundred six and one tenth (706.1) feet to a stone monument, thence North $5^{\circ} 11' 45''$ West along land supposed to belong to Thomas Modena about four hundred seventy-three and four tenths (473.4) feet to a stone monument on top of a large boulder, thence North $10^{\circ} 28' 30''$ East along land of said Modena about three hundred fifty-four and three tenths (354.3) feet to a stone monument, thence South $83^{\circ} 31' 40''$ East about seven hundred eighteen and three tenths (718.3) feet to a stone monument, thence South $38^{\circ} 08' 30''$ East about one hundred sixty-four and eight tenths (164.8) feet to a stone monument, thence North $71^{\circ} 01' 20''$ East about nine hundred forty-three and five tenths (943.5) feet to a stone monument, thence South $43^{\circ} 54' 25''$ East about six hundred forty-six and four tenths (646.4) feet to a stone monument, thence North $46^{\circ} 04' 30''$ East about three hundred sixty-six and four tenths (366.4) feet to a stone monument on the westerly side of the Tekoa Road, thence south-easterly along the said Tekoa Road to a stone monument on the easterly side of said road, bearing South $44^{\circ} 36' 45''$ East about four hundred sixty-three and three tenths (463.3) feet from last mentioned monument, thence South $85^{\circ} 24' 20''$ East along land of Thomas Modena about nine hundred ninety-nine and five tenths (999.5) feet to a stone monument at land supposed to belong to Walter Allen, thence South $3^{\circ} 59' 40''$ West along land of said Allen and land of Chas. M. Hayden about seven hundred sixteen and eight tenths (716.8) feet to a point at north-easterly corner of tract #1, thence westerly crossing the Tekoa Road about ten hundred twenty (1020.) feet, thence southerly about three hundred twenty-five (325.) feet, thence westerly about twelve hundred ten (1210.) feet to place of beginning. Containing about eighty-five acres one hundred twenty-seven square rods (85 A. 127 R.) The foregoing described tract being the same tract deeded to said Hallbourg by Florian Anton, October 16th., 1905 and recorded in Hampden County Registry of Deeds, Book 691, Page 149.

Said Town of Westfield, by its Board of Water Commissioners, Sumner W. Hildreth, F. S. Dewey Jr. and J. Horton Packard, for the purposes aforesaid have taken all the right to the aforescribed tracts of land.

In witness whereof, we, the said Sumner W. Hildreth, F. S. Dewey Jr. and J. Horton Packard, have hereunto set our hands this first day of December in the year of our Lord, one thousand nine hundred and five.

Signed) *Sumner W. Hildreth*)
James Horton Packard)
Frank S. Dewey Jr.)

Board of Water

Commissioners.

In the presence of

Oren E. Parks

FORMERLY
SHERMAN and FOWLER
S-50°-20'-E
1043.

HIGHWAY

BROOK

PERRY

N-23°-25'-E

3282.1

WOOD ROAD

4530.1

BROOK

MONTGOMERY

AREA=102 ACRES.

750.1 TOWN LINE
N-22°-14'-W

WESTFIELD WATER WORKS
Montgomery Supply
- MAP OF LAND TAKEN -
- LUCY W. PERKINS -
- SCALE: 1 INCH = 200 FEET -
- JOHN L. HYDE - C.E. -
- 1912 -

TOWN LINE
N-22°-09'-E
762.1

Iron Mt.

1053.1
N-60°-42'-W
BUTLER

HIGHWAY

Land taken of Lucy W. Perkins, May 1, 1912.

KNOW ALL MEN,

That the Town of Westfield, in accordance with the authority given by an Act of the Legislature of Massachusetts entitled "An Act to Supply the Town of Westfield with Pure Water", approved May 29, 1873 and for the purpose named in the 1st. and 3rd. sections of said Act, have taken and do hereby take the following described land situated in Montgomery, Hampden County, Massachusetts, and supposed to belong to Lucy W. Perkins.

Commencing at a stone monument on the westerly side of the highway at land of F. M. Butler; thence N. $60^{\circ}42'$ W. along land of said Butler about one thousand fifty-three (1053) feet to an iron monument supposed to be in the Montgomery and Russell town line; thence N $22^{\circ}39'$ E. about seven hundred sixty-two (762) feet to a stone monument supposed to be in the said town line; thence N. $22^{\circ}14'$ W. about seven hundred ninety (790) feet to a stone monument supposed to be in the said town line and at land of Perry; thence N. $23^{\circ}25'$ E. along land of said Perry, about three thousand two hundred eighty-two (3282) feet to a stone monument at land formerly of Sherman and Fowler; thence S. $50^{\circ}28'$ E. along said land about one thousand forty-three (1043) feet to a stone monument on the westerly side of the highway; thence southerly along said highway about four thousand six hundred thirty (4630) feet to the place of beginning, containing about one hundred two (102) Acres. The foregoing described tract being the same tract deeded to said Lucy W. Perkins by Leon D. Blood etc. May 15, 1911 and recorded in Hampden County Registry of Deeds, Book 823, Page 334 and by Luther Hollister etc. April 10, 1911 and recorded in Hampden County Registry of Deeds, Book 805, Page 461.

Said Town of Westfield, by its Board of Water Commissioners S. A. Allen, S. W. Hildreth and J. S. Davine, for the purpose aforesaid have taken all right to the afore described tract of land.

In Witness Whereof, we, the said S. A. Allen, S. W. Hildreth and J. S. Davine, have hereunto set our hands this first day of May in the year of our Lord, one thousand nine hundred and twelve.

(Signed)

S. A. Allen
J. S. Davine

Board of
Water Commissioners.

In the presence of

Jos. P. Rife

ANDREW J. & EUNICE HALL

CEMETERY

N. 82° 01' E

1550.

S.M.

ARTHUR J. WASHBURN

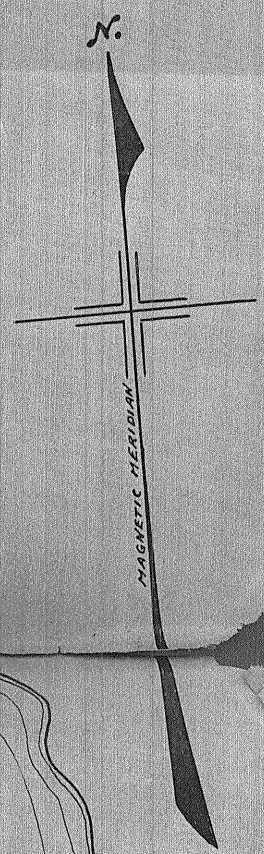
WESTFIELD WATER WORKS
Montgomery Supply
- MAP OF LAND TAKEN -
- WILBERT T. MOORE -
- SCALE: 1 INCH = 200 FEET -
- JOHN L. HYDE - C.E. -
- 1915 -

TRACT 1.
AREA = 81.6 ACRES.

DAVID L. ALLYN

E 1970

S. 82° 45' W.



MOOSE MEADOW POND

HARRY A. TREADWELL

HIGHWAY

TRACT 2.
AREA = 15 ACRES

HARRY A. TREADWELL

Y OF WESTFIELD

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this twenty-ninth day of December, in the year nineteen hundred and fifteen, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Montgomery in said County of Hampden, and are described as follows:-

Tract #1. Commencing at a point in the northerly line of the highway passing the Mountain House and in the middle of Moose Meadow Brook, thence westerly along said highway about twenty-one hundred and twenty-five feet to a stone monument at land of Andrew J. & Eunice Hall, thence North 5° 52' East about eighteen hundred thirty-two (1832) feet to a stone monument, thence North 82° 01' East about fifteen hundred fifty (1550) feet to a stone monument at land of Arthur J. Washburn, the last two courses are along land of said Hall, thence South 8° 45' West along lands of said Washburn and of David L. Allyn about nineteen hundred seventy (1970) feet, thence easterly along said Allyn to Moose Meadow Pond, thence southerly along said Pond to the place of beginning, containing about eighty-one and six tenths (81.6) acres.

Tract #2. Commencing at a stone monument on the southerly side of the highway passing the Mountain House about opposite the middle of Tract #1, thence South 9° 14' West about one hundred eighty-two (182) feet, thence North 87° West about three hundred twenty-four (324) feet, thence North 19° East about two hundred fifty (250) feet to a stone monument on the southerly side of said highway, the three preceding courses are along land of Harry A. Treadwell and defined by stone walls, thence South 74° 21' East about two hundred eighty (280) feet to the place of beginning, containing about one and five tenths (1.5) acres.

The foregoing described tracts are supposed to belong to Wilbert T. Moore of Huntington, Massachusetts.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners.

(

S. W. Hildreth,

Geo. H. Byars

In the presence of

Clayton W. Root

4893

HAMPDEN Co REGISTRY OF DEEDS
RECEIVED AND RECORDED

MAR 25 1916

AT 9 00 56 M a M

ANDREW J. & EUNICE HALL

$N-82^{\circ}01'E.$

S.M.

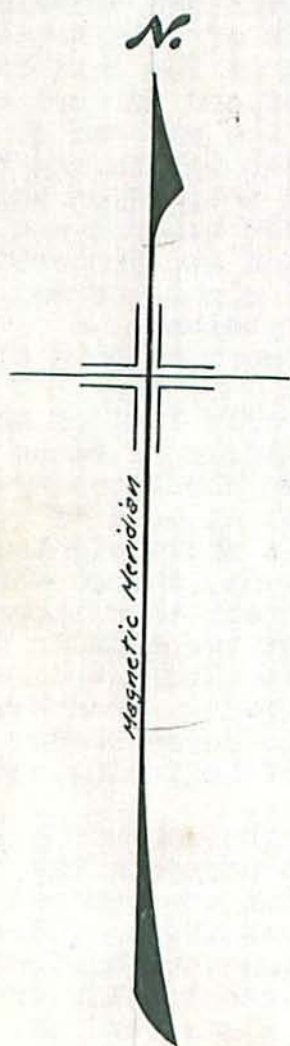
RECEIVED and RECORDED

MAR 25 1916

AT 9 00 56 M. A. M.

ARTHUR J. WASHBURN

WESTFIELD-WATER-WORKS
Montgomery Supply
- MAP OF LAND TAKEN -
- WILBERT T. MOORE -
- SCALE: 1 INCH = 200 FEET. -
- JOHN LHYDE - C.E. -
- 1916. -



$S-8^{\circ}45'W.$

1760

DAVID L. ALLYN

MOOSE MEADOW POND

S.M.

AREA
AS ACRES.

(Wilbert T. Moore)

Description of property of the Town of Westfield
located in the Town of Montgomery, Mass.

Commencing at a stone monument in the westerly line of land of David L. Allyn and bearing South $8^{\circ}45'$ West about seventeen hundred sixty (1760) feet from a stone monument at the southeasterly corner of land of Andrew J. & Eunice Hall, thence South $34^{\circ}30'$ East along land of said Allyn About two hundred sixty-two (262) feet to a stone monument at land of Town of Westfield, thence westerly about one hundred eighty-five (185) feet, thence North $8^{\circ}45'$ East about two hundred ten (210) feet to the place of beginning, containing about forty-five one-hundredths (.45) acres.

December 30, 1915.

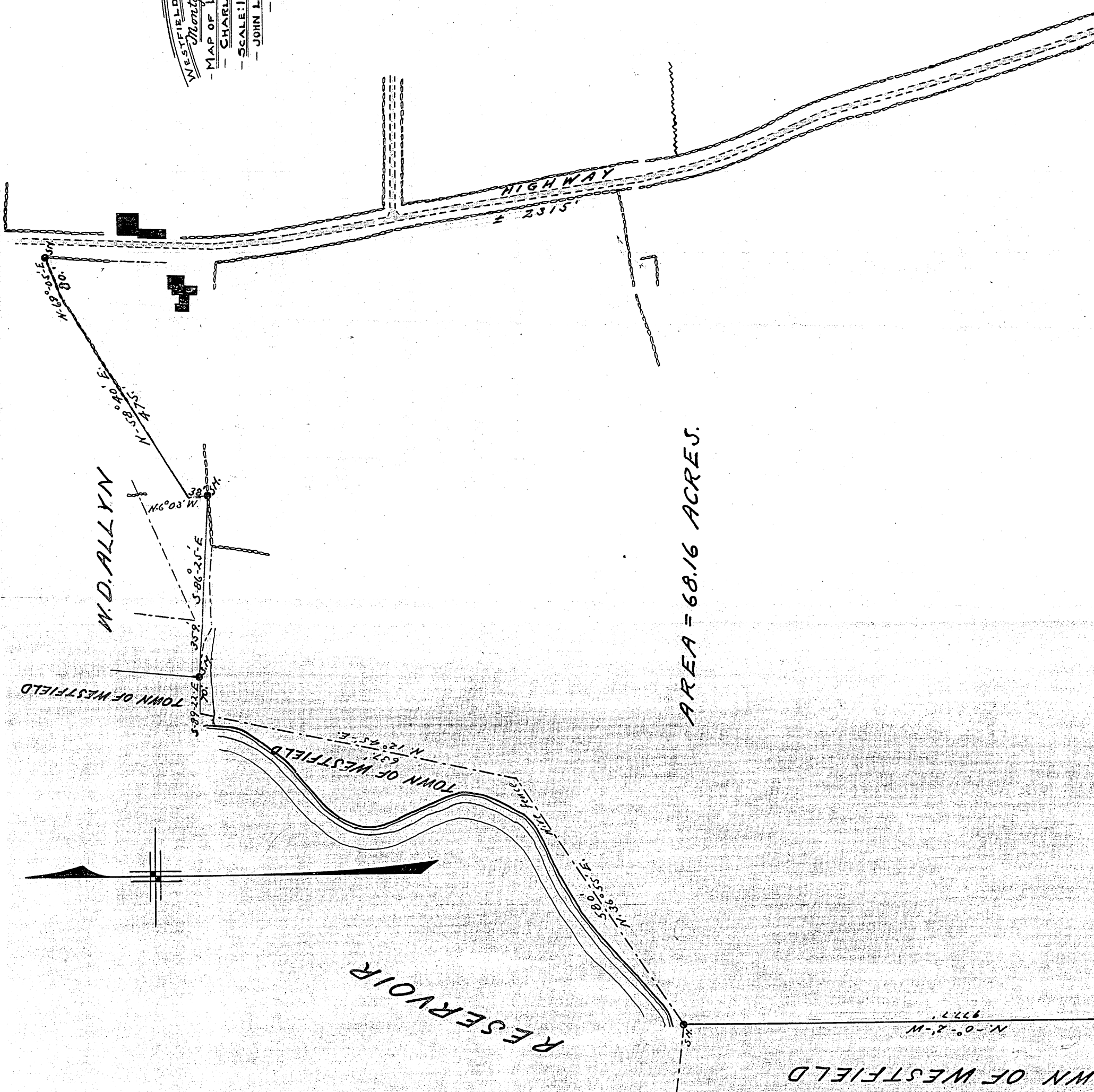
2754

HAMPSHIRE CO. REGISTRY OF DEEDS
RECEIVED AND RECORDED

FEB 14 1917

AT 2 O'C. 10 M. P. M.

WESTFIELD-WATER-WORK
 Montgomery Supply
 - MAP OF LAND TAKEN -
 - CHARLES H. KELSO -
 - SCALE: 1 INCH = 200 FEET -
 - JOHN L. HYDE, C.E. -
 - 1916 -



(Charles H. Kelso)

Description of property of the Town of Westfield
located in the Town of Montgomery, Mass.

Commencing at a stone monument on the westerly side of the highway, known as Pitcher Street, opposite the school house and at the northeasterly corner of land of W. D. Allyn, thence North $88^{\circ}28'$ West along land of said Allyn about nineteen hundred ninety-three (1993) feet to land of the Town of Westfield, thence North $0^{\circ}02'$ West about nine hundred seventy-seven and seven tenths (977.7) feet to a stone monument, thence North $36^{\circ}55'$ East about five hundred eighty (580) feet, thence North $12^{\circ}45'$ East about six hundred thirty-seven (637) feet, thence South $89^{\circ}22'$ East about seventy (70) feet to a stone monument at land of said Allyn, the four preceeding courses are along land of the Town of Westfield, thence South $86^{\circ}25'$ East about three hundred fifty-nine (359) feet to a stone monument, thence North $6^{\circ}03'$ West about thirty-eight (38) feet, thence North $58^{\circ}40'$ East about four hundred seventy-five (475) feet, thence North $69^{\circ}05'$ East about eighty (80) feet to a stone monument on the westerly side of said Pitcher street, the four preceeding courses are along land of said Allyn, thence southerly along said street about twenty-three hundred fifteen (2315) feet to the place of beginning, containing about sixty-eight and sixteen one-hundredths (68.16) acres.

April 29, 1916.

2755

HAMDEN CO REGISTRY OF DEEDS
RECEIVED AND RECORDED

FEB 14 1917

AT 2 O'CLOCK M *C* M

DAVID L. ALLYN

ADELAIDE PITTSINGER

EDWARD C. CLARK

WESTFIELD-WATER-WORKS.
Montgomery Supply
 - MAP OF LAND TAKEN -
 - OCENIUS E. MOORE -
 - SCALE: 1 INCH = 200 FEET -
 - JOHN L. HYDE - C.E. -
 - 1917 -

(Ocenius E. Moore)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this sixth day of February, in the year nineteen hundred and seventeen, taken, appropriated and now holds the land and property herein after described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Montgomery in said County of Hampden, and are described as follows:-

Tract #1. Commencing at a stone monument on the westerly side of the highway leading from the Montgomery town hall southerly toward Russell, thence southerly along said highway about eleven hundred and fifteen (1115) feet to land of Adelaide Pittsinger, thence North $38^{\circ}18'$ West about three hundred forty-five (345) feet, thence North $23^{\circ}05'$ West about four hundred forty (440) feet to a 24" black birch tree, thence South $75^{\circ}35'$ West six and five tenths (6.5) feet to a stone monument, thence same course about two hundred eighty-four (284) feet, thence South $83^{\circ}03'$ West about three hundred fifteen (315) feet to a stone monument at land of David L. Allyn, the last four courses are along land of said Pittsinger, thence North $3^{\circ}43'$ East about five hundred sixty-four (564) feet to a stone monument, thence South $81^{\circ}02'$ East about two hundred eighty-eight (288) feet, thence North $89^{\circ}20'$ East about seven hundred twenty-nine (729) feet to the place of beginning, the last three courses are along land of said Allyn, containing about fourteen and thirty-two one-hundredths (14.32) acres.

Tract #2. Commencing at a stone monument on the easterly side of said highway opposite Tract #1 and at the southwest corner of land of Edward C. Clark, thence North $84^{\circ}40'$ East about eighty (80) feet to a stone monument, thence South $3^{\circ}21'$ East about fifty (50) feet to a stone monument, thence South $29^{\circ}05'$ West about one hundred twenty-two (122) feet to a stone monument on the easterly side of said highway, the last three courses are along land of said Clark, thence northerly along said highway about one hundred fifty (150) feet to the place of beginning, containing about eighteen one-hundredths (.18) acres.

Tract #3. Commencing at a stone monument on the easterly side of said highway and in the westerly line of land of said Clark, thence South $35^{\circ}45'$ East about two hundred seventeen (217) feet to a stone monument, thence South $50^{\circ}36'$ West about one hundred forty-four (144) feet to a stone monument, thence North $59^{\circ}30'$ West about one hundred ninety (190) feet to a stone monument on the southerly side of said highway, the last three courses are along land of said Clark, thence northeasterly along said highway about two hundred thirty (230) feet to the place of beginning, containing about eighty-three one-hundredths (.83) acres.

The foregoing described tracts are supposed to belong to
Ocenius E. Moore of Huntington, Massachusetts.

In Witness Whereof, the said Town of Westfield has caused
this instrument to be signed by the Water Commissioners of said
Town.

Board of
Water Commissioners.

N. C. Lane
L. W. Hildreth
Geo. H. Byers

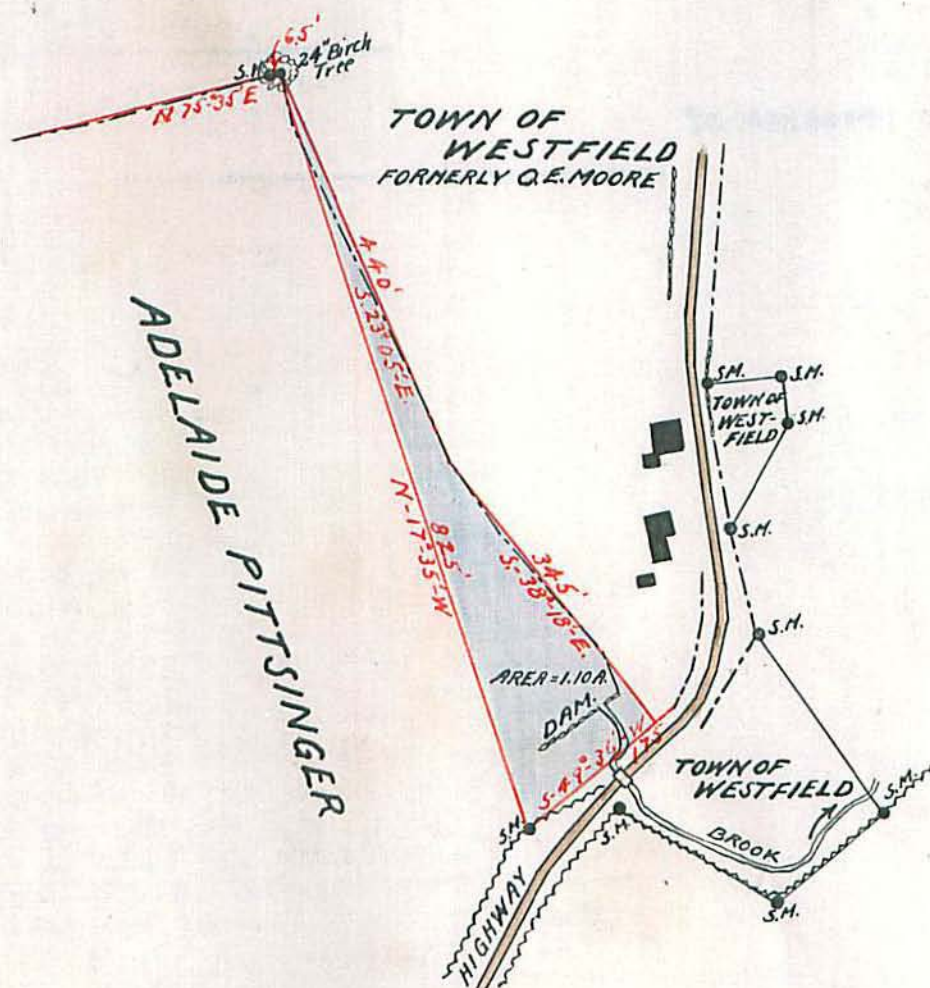
In the presence of

2756

HAMPDEN Co. Registry of Deeds
RECEIVED AND RECORDED

FEB 14 1917

AT 2 O'C 10 M P M



E. C. CLARK

WESTFIELD-WATER-WORKS.
Montgomery Supply
- MAP OF LAND TAKEN -
- ADELAIDE PITTSINGER -
- SCALE: 1 INCH = 200 FEET -
- JOHN L. HYDE - C.E. -
- 1917 -

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part, execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this sixth day of February, in the year nineteen hundred and seventeen, taken, appropriated and now holds the land and property herein-after described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Montgomery in said County of Hampden, and are described as follows:-

Commencing at a point on the northerly side of the highway leading from the Montgomery town hall toward Russell and at the southwesterly corner of land of the Town of Westfield, formerly of O. E. Moore, thence South $49^{\circ}36'$ West along said highway about one hundred seventy-five (175) feet to a stone monument, thence North $17^{\circ}35'$ West along land of said Pittsinger about eight hundred twenty-five (825) feet to a 24" black birch tree at land of said Town, thence South $23^{\circ}05'$ East about four hundred forty (440) feet, thence South $38^{\circ}18'$ East about three hundred forty-five (345) feet to the place of beginning, the last two courses are along land of said Town, formerly of said Moore, containing about one and one tenth (1.1) acres.

The foregoing described tract is supposed to belong to Adelaide Pittsinger of Montgomery, Massachusetts.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners.

H. C. Lane

L. W. Childs

Geo. H. Byers

In the presence of

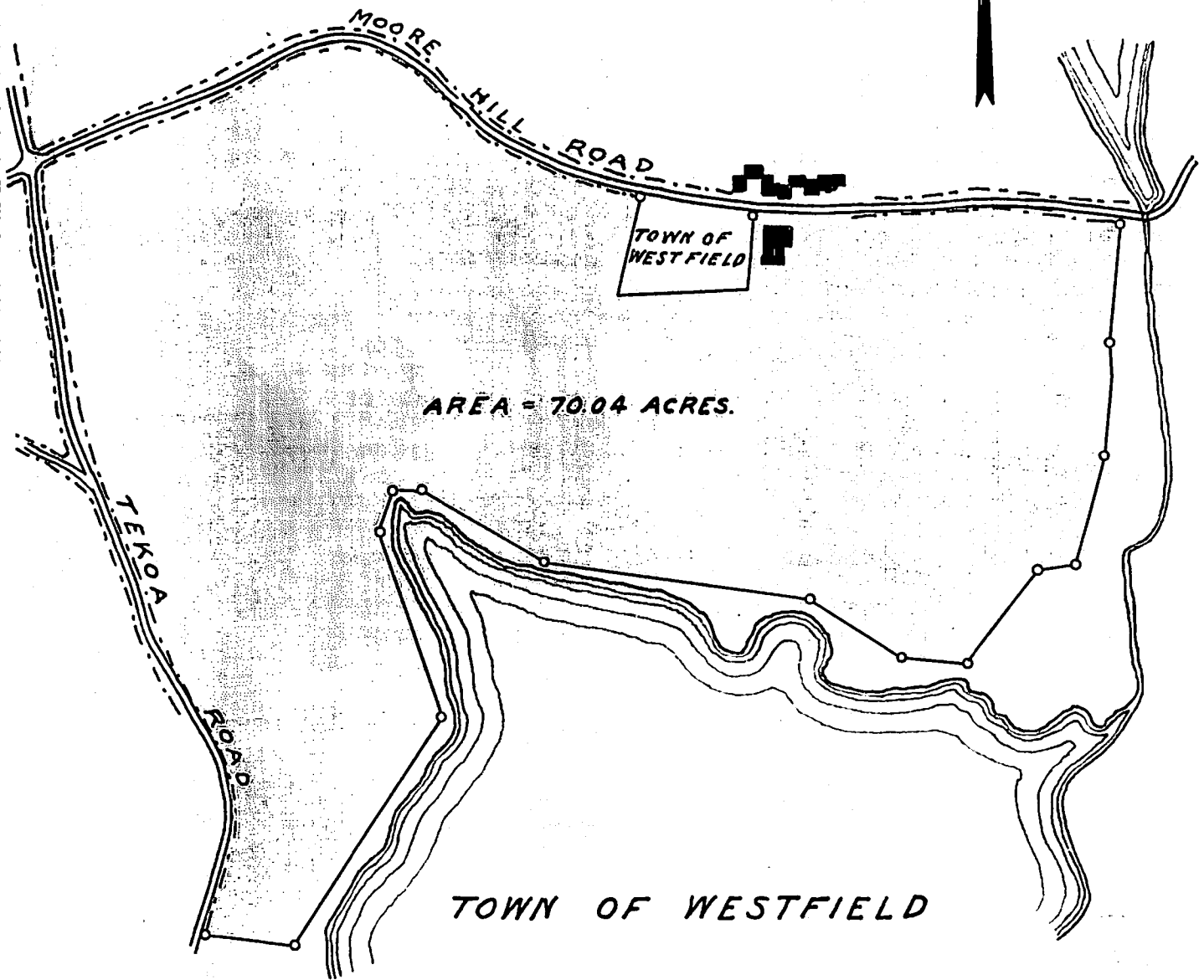
2757

HAMPTON Co. Registry of Deeds
RECEIVED AND RECORDED

FEB 14 1917

AT 2 00 10 M P M

WESTFIELD-WATER-WORKS
Montgomery Supply
MAP OF LAND TAKEN
- C. O. MOORE -
- SCALE: 400 FT. = 1 INCH. -
- JOHN L. HYDE - C.E. -
- 1918. -



RECEIVED AND RECORDED

JUL 3 1918

(Clifford O. Moore)

AT 3.00 PM P.M.

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefor, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this seventh day of May, in the year nineteen hundred and eighteen, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Montgomery in said County of Hampden, and are described as follows:-

Bounded north by the Moore Hill road and land of the Town of Westfield, east and south by land of the Town of Westfield, and west by the Tekoa road, containing about seventy and four one-hundredths (70.04) acres.

The foregoing described tract is supposed to belong to Clifford O. Moore of Hartford, Conn.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

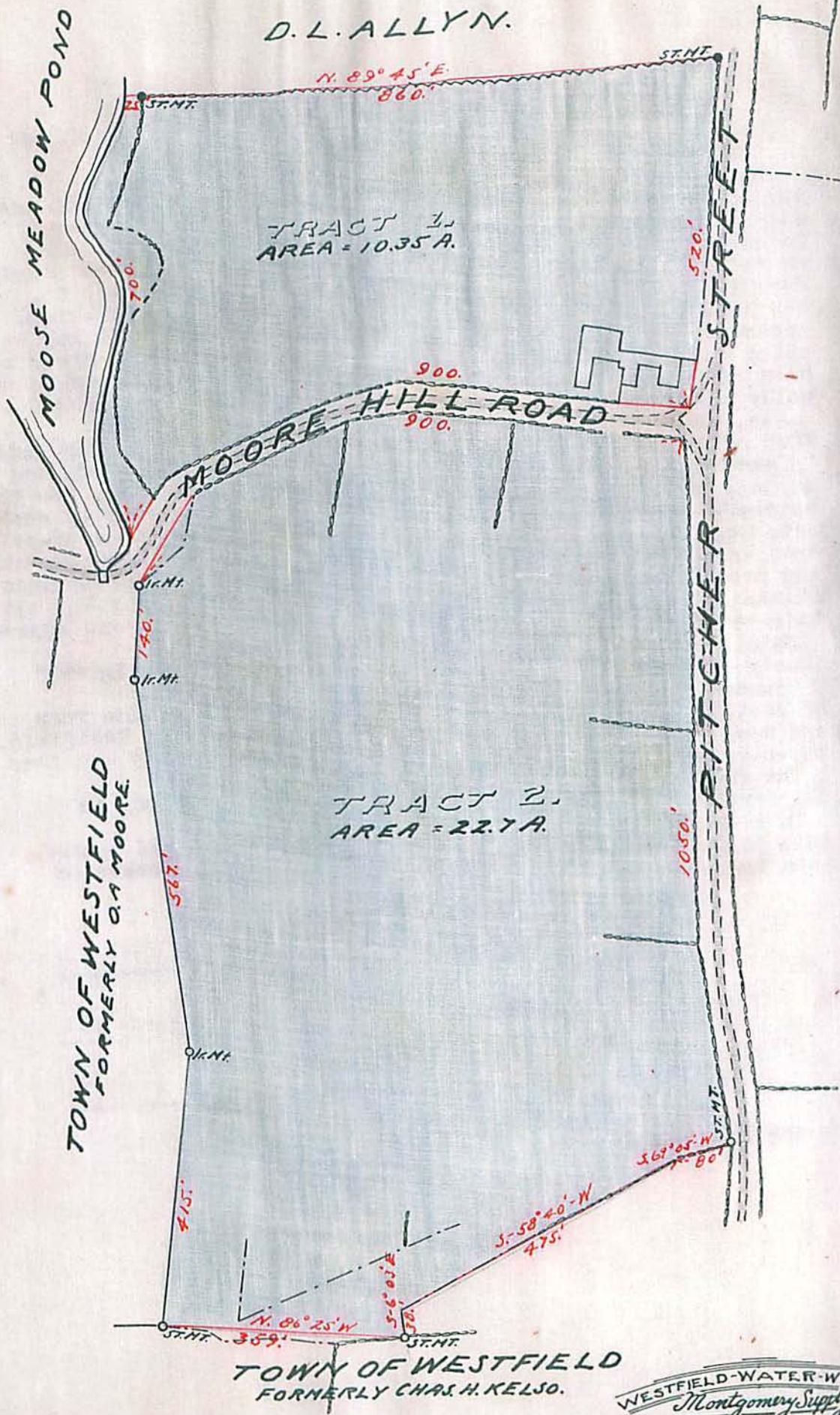
Water Commissioners.

H. C. Lane
Peter [unclear]
E. G. Clark

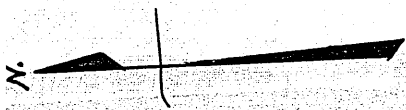
In the presence of

John L. Hyde

D. L. ALLYN.



WESTFIELD-WATER-W
Montgomery Supply
MAP OF LAND TAKE
- WALTER D. ALLYN
- SCALE: 1 inch = 200 FEET
- ORENE PARKS - CE.
- 1919 -



TOWN OF WESTFIELD.
FORMERLY BRAGFREDE.

TOWN OF WESTFIELD.
FORMERLY CHAS. H. KELSO.

TRACT 3,
AREA = 39.8 A.

MODENA

PITCHER STREET

HALL

WESTFIELD WATER WORKS.
Montgomery Supply
- MAP OF LAND TAKEN -
- WALTER D. ALLYN -
- SCALE: 1 INCH = 200 FEET -
- ORENE PARKS - CE. -
- 1919 -

(Walter D. Allyn)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know all Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this nineteenth day of May, in the year nineteen hundred and nineteen, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Montgomery in said County of Hampden, and are described as follows:-

Tract No. 1. Commencing at a point on the Westerly side of the highway known as Pitcher Street, at land supposed to belong to D. L. Allyn; thence Southerly along said highway about five hundred twenty (520) feet to the highway known as Moore Hill Road; thence Westerly along said road about nine hundred (900) feet to Moose Meadow Pond; thence Northerly along said pond about seven hundred (700) feet to land supposed to belong to D. L. Allyn; thence North $89^{\circ} 45'$ East along said land of D. L. Allyn about twenty-five (25) feet to a stone monument; thence same course along said land of Allyn about eight hundred sixty (860) feet to place of beginning; containing about ten and thirty-five one-hundredths (10.35) acres.

Tract No. 2. Commencing at a stone monument on the westerly side of the highway known as Pitcher Street, at land of Town of Westfield, formerly of Charles H. Kelso; thence South $69^{\circ} 05'$ West about eighty (80) feet; thence South $58^{\circ} 40'$ West about four hundred seventy-five (475) feet; thence South $6^{\circ} 03'$ East about thirty-eight (38) feet to a stone monument; thence North $86^{\circ} 25'$ West about three hundred fifty-nine (359) feet to a stone monument at land of Town of Westfield, formerly of O. A. Moore, the last four courses being along land formerly of said Kelso; thence Northerly about four hundred fifteen (415) feet to an iron monument; thence Northerly about five hundred sixty-seven (567) feet to an iron monument; thence northerly about one hundred forty (140) feet to an iron monument on the southerly side of the highway known as Moore Hill Road, the last three courses being along land of Town of Westfield, formerly of O. A. Moore; thence Easterly along said road about nine hundred (900) feet to Pitcher Street, so called; thence Southerly along said street about ten hundred fifty (1050) feet to place of beginning; containing about twenty-two and seven-tenths (22.7) acres.

Tract No. 3. Commencing at a stone monument on the westerly side of the highway known as Pitcher Street, at land of Town of Westfield, formerly of Charles H. Kelso; thence North $88^{\circ} 28'$ West along said land formerly of Kelso, about

nineteen hundred ninety-three (1293) feet to other land of Town of Westfield, formerly of Anna C. S. Bargfrede; thence South $0^{\circ} 02'$ East along said land formerly of Bargfrede, about eighty-two (82) feet to a stone monument at land supposed to belong to one Modena; thence South $0^{\circ} 50'$ West along land of said Modena about eleven hundred (1100) feet to a stone monument at other land of Town of Westfield, formerly of Frank Hallbourg; thence South $2^{\circ} 30'$ West along said land formerly of Hallbourg about three hundred ninety-five (395) feet to a twin chestnut tree at land supposed to belong to one Hall; thence South 88° East about six hundred forty (640) feet to a stone monument; thence North $4^{\circ} 15'$ East about five hundred ten (510) feet; thence North $1^{\circ} 40'$ West about five hundred eighty (580) feet to a stone monument; thence South 86° East about five hundred five (505) feet; thence South $87^{\circ} 45'$ East about nine hundred twenty (920) feet to a stone monument on the westerly side of said highway known as Pitcher Street, the last five courses being along land supposed to belong to said Hall; thence Northerly along Pitcher Street about five hundred thirty-two (532) feet to place of beginning; containing about thirty-nine and eight-tenths (39.8) acres.

The foregoing described tracts are supposed to belong to Walter D. Allyn of Montgomery, Mass.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners

A. C. Lane
Peter J. Quinn
Edward G. Black

In the presence of

John E. Cook

19881

HAMPDEN CO. REGISTRY OF DEEDS
 RECEIVED AND RECORDED

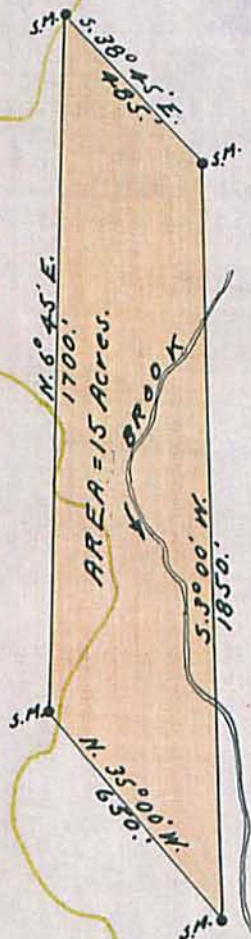
NOV 7 1919

AT 10.00 54 M. a. M.

RUSSELL ROAD

IDA HELMES

EARLE HELMES



HARRY MOORE

ARCHIE & GEORGE MARCOULIER

MODENA

CITY OF WESTFIELD
FORMERLY BARGFREDE

FEARNO ROAD

WESTFIELD WATER WORKS.
Montgomery Supply
- MAP OF LAND TAKEN -
ANDREW J. & EUNICE D. HALL.
- SCALE: 1 inch = 400 feet -
A. I. PEABODY, Engr.

(Andrew J. Hall & Eunice D. Hall)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the provisions of said Act:-

Now, therefore, Know All Men By These Presents, that the city of Westfield, acting through its Board of Public Works, to whom was conferred the powers and duties of the Water Commissioners of the town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this nineteenth day of December, in the year nineteen hundred and twenty-two, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Montgomery in said County of Hampden, and are described as follows:-

Commencing at a stone monument at the north-easterly corner of land supposed to belong to Earl Helmes and in the south-westerly line of land supposed to belong to Ida Helmes; thence turning South 38°45' East along land supposed to belong to Ida Helmes about 485 feet to a stone monument at land supposed to belong to Harry Moore; thence South 3° West along land supposed to belong said Harry Moore and along land supposed to belong to Arthur and George Marcoulrier about 1850 feet to land supposed to belong to Modena; thence North 35° West along land supposed to belong to said Modena, about 650 feet to a stone monument at land supposed to belong to said Earl Helmes; thence North 6°45' East along land supposed to belong to said Earl Helmes about 1700 feet to the place of beginning; containing about 15 acres.

The foregoing described tract is supposed to belong to Andrew J. Hall and Eunice D. Hall of Montgomery, Mass.

In Witness Whereof, this instrument is signed by the Board of Public Works acting for said City of Westfield.

Board of

Public Works.

Andrew J. Hall
Eunice D. Hall
Peter J. J. J.

20707

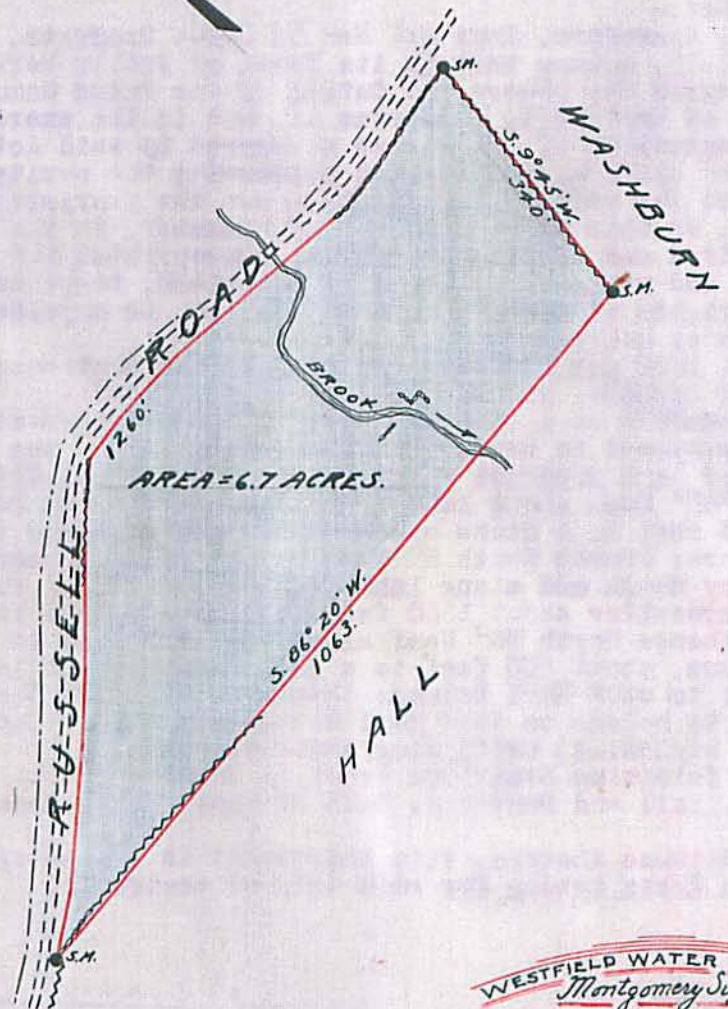
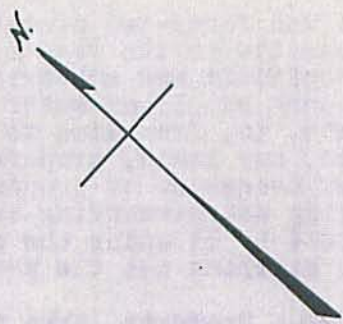
HAMPDEN CO. REGISTRY OF DEEDS
 RECEIVED AND RECORDED

AUG 13 1923

AT 3 00.05 M. P. M.

In the presence of

Ona E. J. J.



WESTFIELD WATER WORKS.
Montgomery Supply
- MAP OF LAND TAKEN -
- C.A. WILLIAMS. -
- SCALE: 1 INCH = 200 FEET -
- A.L. PEABODY - ENGR. -
- 1923. -

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the provisions of said Act:-

Now, therefore, Know All Men By These Presents, that the city of Westfield, acting through its Board of Public Works, to whom was conferred the powers and duties of the Water Commissioners of the Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this eleventh day of July, in the year nineteen hundred and twenty-three, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Montgomery in said County of Hampden, and are described as follows:-

Commencing at a stone monument on the southerly side of the Russell Road, sometimes called the "Old House Road", at northwest corner of land supposed to belong to one Washburn; thence running South 9°45' West along land of said Washburn about 340 feet to a stone monument at land of Andrew J. & Eunice D. Hall; thence South 86°20' West along said land of Andrew J. & Eunice D. Hall about 1063 feet to a stone monument on the southerly side of said Russell Road; thence northeasterly and easterly along said road about 1260 feet to place of beginning; containing about 6.7 acres.

The foregoing described tract is supposed to belong to C. A. Williams of Montgomery, Mass.

In Witness Whereof, this instrument is signed by the Board of Public Works acting for said City of Westfield.

Board of
Public Works

W. H. Davis
J. O. McKean
John L. Barry

In the presence of

Ann D. Davis

20708

HAMPDEN CO. REGISTRY OF DEEDS
RECEIVED AND RECORDED

AUG 13 1923

AT 3 00 05 M. P. M.

Westfield Water Works - Granville Supply - Description of Land Taken & Location Maps - 1898



1898 Reports

"Westfield Water Works - Granville Supply - Description of Lands Taken and Location Maps 1898".
Filed Hampden County Registry of Deeds Document #2548 April 5, 1898, James R. Wells, Register.
Chapter 342 Acts 1895. See also: Hampden County Registry of Deeds Book 631, Page 122.

Bridges	Cowle's Bridge
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City/Town	Southwick
-----------	-----------

City/Town	Westfield
-----------	-----------

City/Town	Granville
-----------	-----------

Name	Crane, Robert B
------	-----------------

Name	Jensen, Marius
------	----------------

Name	Warner
------	--------

Name	Hollister, Hubbard
------	--------------------

Name	Delmar
------	--------

Name	Rowley
------	--------

Name	Pendleton, Benjamin E
------	-----------------------

Name	Arnold, Warren D
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Name	Henrickson, Peter
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Name	Bruch, A J
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Name	Leahey, William J
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Name	Birge, Eli
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Name	Fowler, Morton J
------	------------------

Name	Sackett, Enoch
Name	Provost, Mary
Name	Loomis, George B
Name	Kellogg, L C
Name	Nelson, Robert
Name	Sampson, George C
Name	Purchase, Elvira
Name	Arnold, Michael
Name	Crane, James A
Name	Strong, George
Name	Benton, Mary A
Name	Lamson, F D
Name	Winchell, Henry
Name	Strong, Carlton
Name	Rowley, Christina
Name	McElligott, John
Name	Plumley, Isaac
Name	Hallbourg, Frank
Name	Marcouillier, Celina
Name	Hendrickson, Peter
Name	Sullivan, J J
Name	Pearsons, Sara E

Name	Stiles, Lucy M
Name	Stiles, Jerome B
Name	Holcomb, William
Name	Frost, Harriet M
Name	Provost, Moses
Name	Gutierrez, Florence
Name	Hunt
Name	Winchell, Luke
Name	Harrington, John
Name	Fowler, Jospeh J
Name	Brown, Lucy M
Name	Andrews, James H
Name	Searle, William E
Name	Jensen, Jens
Name	Sanderson
Name	Cooley, Ralph
Streets	Mill Street
Streets	Fowler Road
Streets	City View Boulevard
Streets	South Maple Street
Streets	Sackett Road
Streets	West Granville Road

Streets	Granville Road
Streets	Cross Road
Streets	Old Granville Road
Streets	Loomis Street
Streets	Wild Cat Road
Streets	Westfield Road
Streets	Mountain Road
Water	Munns Brook
Water	Mill Pond Dam
Water	Hollister Brook
Water	Japhet Brook
Water	Jacks Brook
Water	Mill Pond
Water	Lamson Brook
Water	Humbert Gutter
Water	Little River
Water	Tillotson Brook
Water	Dickinson Brook
Water	Old Mill Pond

2548

WAMPDEN COUNTY REGISTRY OF DEEDS.

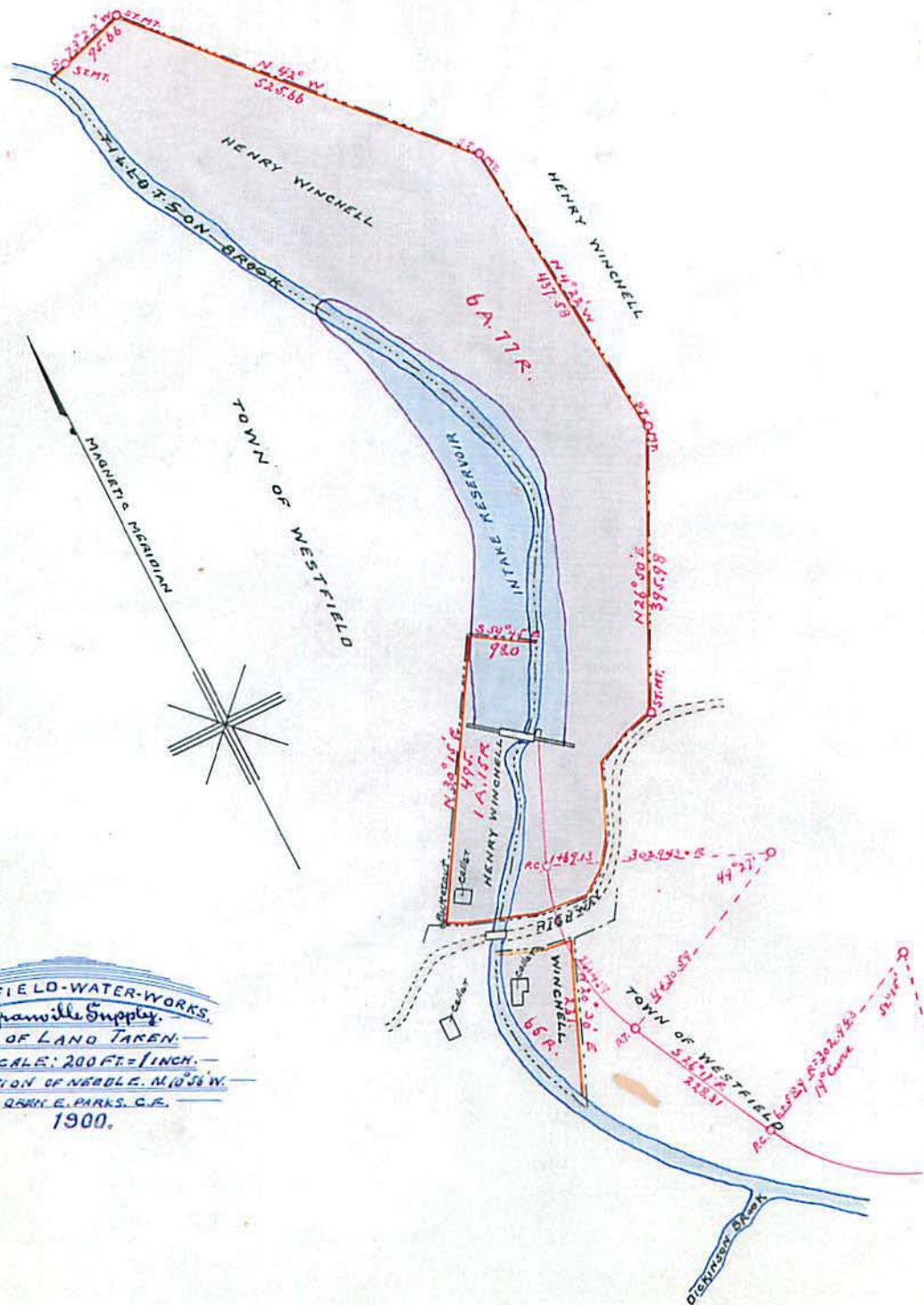
APR 5 1898

Received 2 H. 35 M. *PM.*

Recd and Filed

Attest James R. Wells Register

WESTFIELD WATER WORKS
GRANVILLE SUPPLY
DESCRIPTION OF LANDS TAKEN
AND LOCATION MAPS
1898.



WESTFIELD-WATER-WORKS.
 Granville Supply.
 MAP OF LAND TAKEN.
 SCALE: 200 FEET = 1 INCH.
 VARIATION OF NEEDLE, N. 10° 38' W.
 J. E. PARKS, C.E.
 1900.

WESTFIELD WATER WORKS.

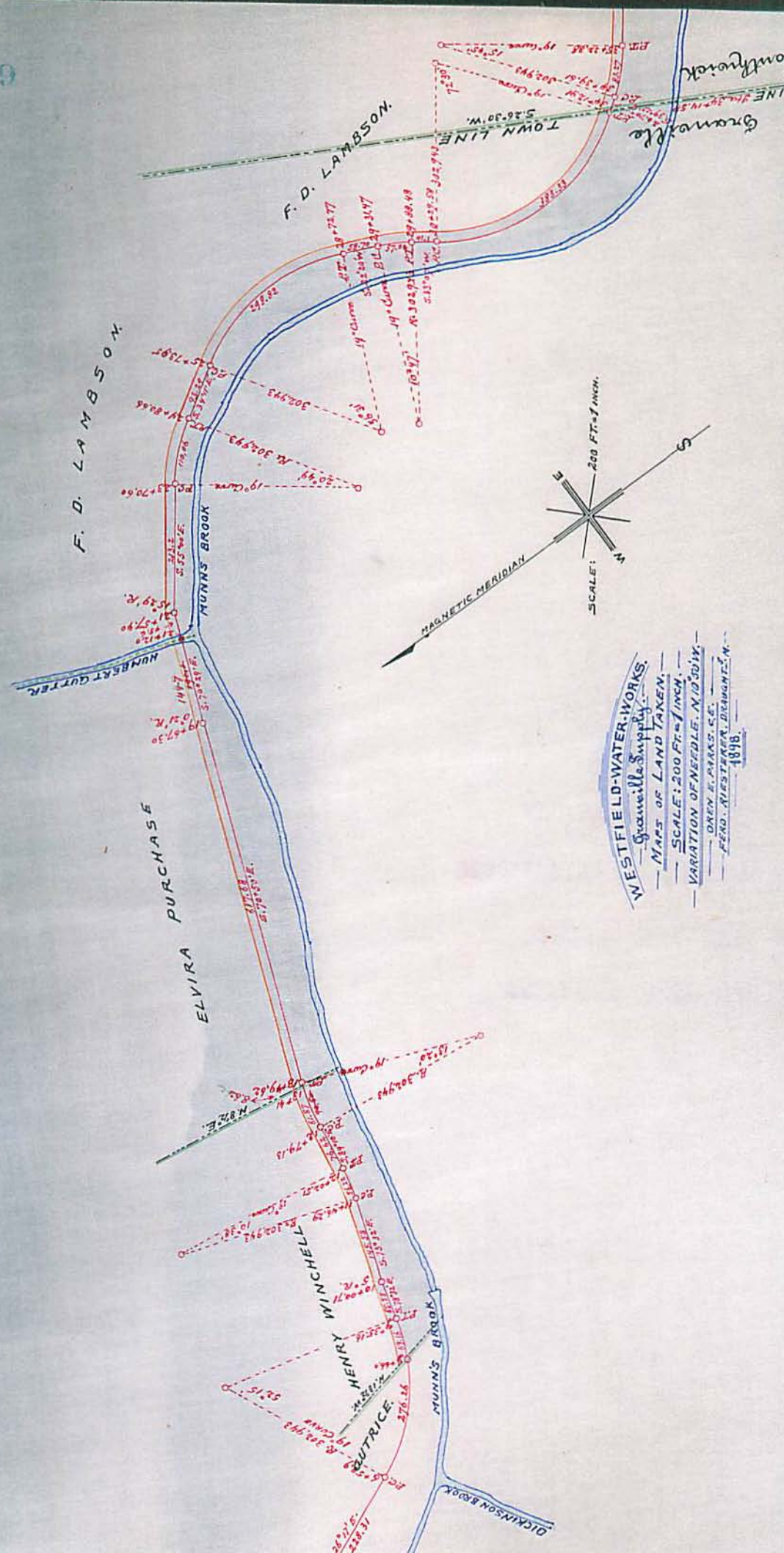
GRANVILLE SUPPLY.

DESCRIPTION OF LAND.

Know All Men that the Town of Westfield in the County of Hampden and Commonwealth of Massachusetts, in the exercise of powers conferred by Chapter three hundred and forty-two of the Acts of the year Eighteen Hundred and Ninety-five, being an Act entitled "An Act to authorize the Town of Westfield to increase its Water Supply", and approved April 30th. 1895, has by its Water Commissioners, for the purpose of supplying the inhabitants of said Town with pure water for the extinguishment of fires and for domestic and other purposes, taken the right to lay and maintain water mains and replace the same and keep the same in repair within certain tracts or parcels of land situated, bounded and described as follows:

One certain tract of land situated in Granville in said County, supposed to belong to HENRY WINCHELL, and described as follows:

Commencing at a stake, supposed to be in the division line between land of Florence Gutierrez and land of Henry Winchell, Sta. 8+66 of location line of Westfield Water Main, and running on a 19° curve to left (radius 302.943 ft.) a distance of about sixty-nine and sixteen hundredths (69.16) feet to a stake Sta. 9+35.16. Thence on course $S. 78^\circ 32' E.$ a distance of about sixty-five and fifty-five hundredths (65.55) feet, to a stake Sta. 10+00.71, thence on an angle of 5° to the right course $S. 73^\circ 32' E.$ a distance of about one hundred forty-five and fifty-eight hundredths (145.58) feet to a stake Sta. 11+46.29, thence on a 19° curve left (radius 302.943 ft.) a distance of about fifty-six and twenty-two hundredths (56.22) feet. Thence tangent course $S. 84^\circ 10' E.$ a distance of about seventy-six and sixty-two hundredths (76.62) feet to a stake Sta. 12+79.13. Thence on a 19° curve right (radius 302.943 ft.) a distance of about sixty-one and eighty-seven hundredths (61.87) feet to a stake Sta. 13+41 a point supposed to be in division line between land of Henry



WESTFIELD-WATER-WORKS.
Granville Supply.
— MAPS OF LAND TAKEN. —
— SCALE: 200 FT. = 1 INCH. —
— VARIATION OF NEEDLE, N. 10° 30' W. —
— DRAWN BY P. A. S. C. E. —
— FIELD, WESTERN, DRAINAGE, N. —
— 1898.

Winchell and land of Elvira Purchase.

The above description is for the center line of location, the whole length on center line being about four hundred seventy-five (475.0) feet. The width of land taken being one rod on the left or northerly side of said center line and all the land to right between center line and Munns Brook, meaning to cover all land lying between the above described division lines and line parallel with and one rod left of said Center line and Munns Brook, containing about one hundred and sixteen (116.0) square rods more or less.

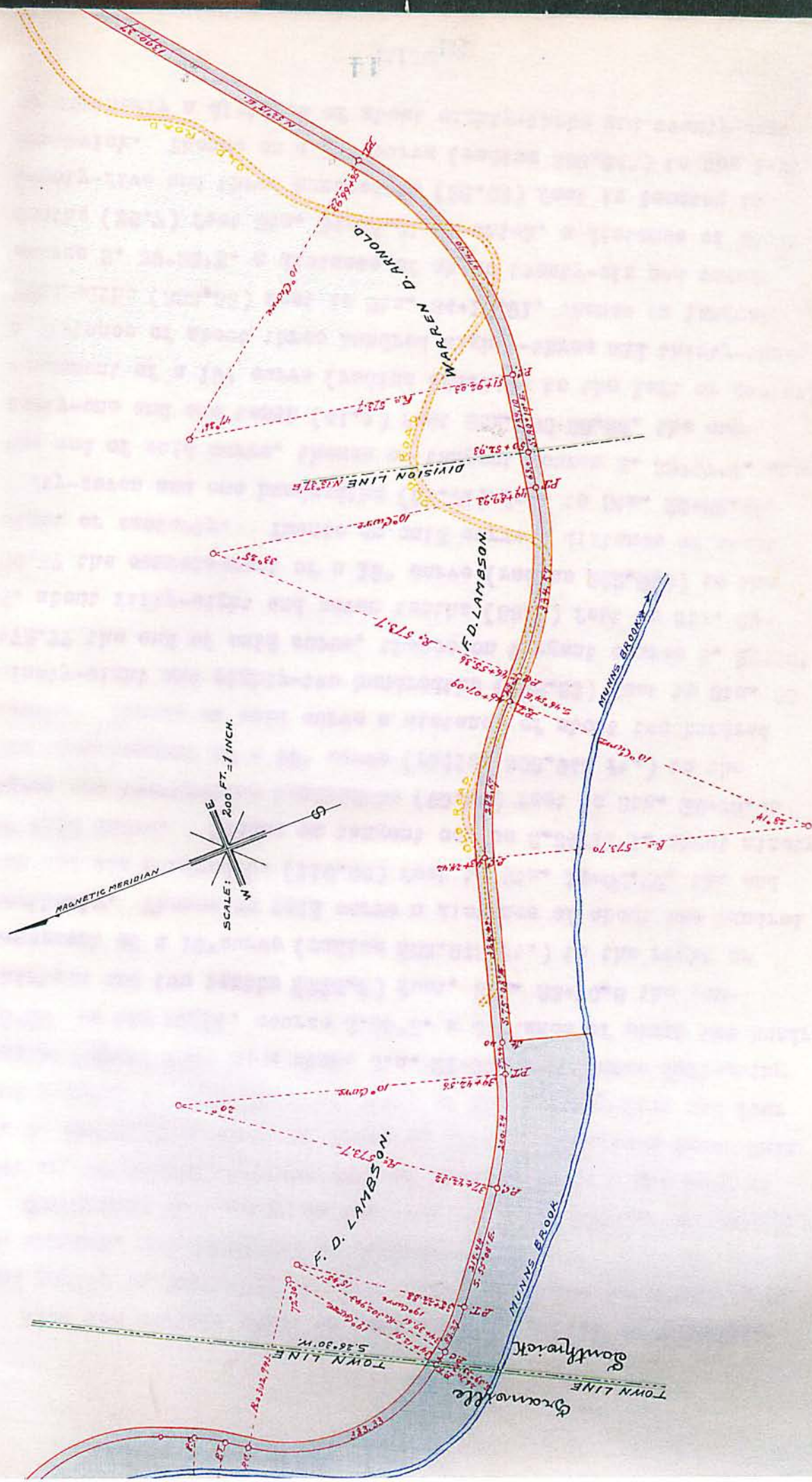
Also one certain tract of land, situated in Granville supposed to belong to ELVIRA PURCHASE, and described as follows:

Commencing at a stake supposed to be in the division line between land of Henry Winchell and land of Elvira Purchase, Sta. 13+41 of location line of ^{Wentfield} Water Main, thence on a 19° curve (radius 302.943 ft.) to the right a distance of about eight and sixty-two hundredths ^(8.62) feet to a stake ^{Sta.} 13+49.62, thence on tangent S. $70^\circ 50'E.$ a distance of about six hundred seventeen and sixty-eight hundredths (617.68) feet to a stake Sta. 19+67.30, thence on an angle to right, course S. $70^\circ 29'E.$ to a Stake Sta. 21+12, a distance of about one hundred forty-four and seven tenths (144.7) feet, a point in center of Humberts Gutter, so called, and in supposed division line, between land of Elvira Purchase and land of F. D. Lambson.

The above description is for the center line of said location the whole length on center line being about seven hundred seventy-one (771.0) feet. The width of land taken being one rod on the left or northerly side of said center line, and all the land to the right of said center line, or southerly, to Munns Brook, so called, meaning to cover all land lying between the above described division lines and lines parallel with and one rod on the left of said center and Munns Brook, so called, containing one acre and twenty-eight and three tenths (one acre 28.3) square rods more or less.

Also one certain tract of land situated partly in Granville and partly in Southwick in said County, supposed to belong to F. D. LAMBSOON, and described as follows:

Commencing at a point in the division line (center of Humberts Gutter, so called) between land of Elvira Purchase and land of F. D. Lambson Sta. 21+12 of location line of Westfield Water Main and running S. $70^{\circ}29'E$. a distance of about forty-five and four tenths (45.4) feet to a stake Sta. 21+57.4. Thence deflecting $15^{\circ}29'$ to the right, course S. $55^{\circ}E$. a distance of about two hundred thirteen and two tenths (213.2) feet, Sta. 23+70.6 the commencement of a 19° curve (radius 302.943 ft.) to the right or southerly. Thence on said curve a distance of about one hundred ten and six hundredths (110.06) feet to Sta. 24+80.66, the end of said curve. Thence on tangent course S. $34^{\circ}11'E$. about ninety-three and twenty-nine hundredths (93.29) feet to Sta. 25+73.95 the commencement of a 19° curve (radius 302.943 ft.) to the south. Thence on said curve a distance of about two hundred ninety-eight and eighty-two hundredths (298.82) feet to Sta. 28+72.77 the end of said curve, thence on tangent course S. $22^{\circ}20'W$. about fifty-eight and seven tenths (58.7) feet to Sta. 29+31.47 the commencement of a 19° curve (radius 302.943) to the right or westerly. Thence on said curve a distance of about fifty-seven and one hundredths (57.01) feet to Sta. 29+88.48, the end of said curve, thence on tangent course S. $33^{\circ}07'W$. about forty-one and one tenth (41.1) feet Sta. 30+29.58, the commencement of a 19° curve (radius 302.943) to the left or easterly ^{thence on said curve} a distance of about three hundred eighty-three and thirty-three hundredths (383.33) feet to Sta. 34+12.91, thence on tangent course S. $39^{\circ}23'E$. a distance of about twenty-six and seven tenths (26.7) feet Sta. 34+39.61 of which, a distance of about twenty-five and three hundredths (25.03) feet is located in Southwick. Thence on a 19° curve (radius 302.943) to the left or northerly a distance of about eighty-three and twenty-seven

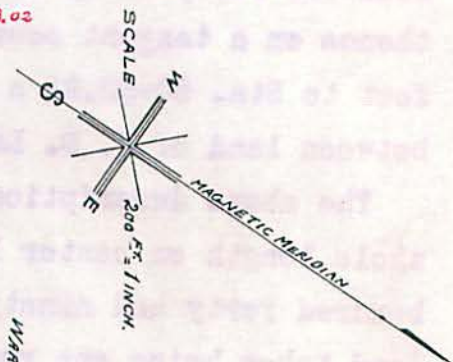


hundredths (83.27) feet to Sta. 35+22.88, thence on a tangent course S. 55°08'E. a distance of about two hundred nineteen and forty-four hundredths (219.44) feet ^{to} Sta. 37+42.32, thence on a 10° curve (radius 573.7 ft.) to the left or northerly a distance of about two hundred and twenty-four hundredths (200.24) feet to Sta. 39+42.56. Thence on a tangent course S. 75°08'E. a distance of about fifty-seven and forty-four hundredths (57.44) feet to Sta. 40, thence on same course S. 75°08'E. a distance of about three hundred twenty-four and forty-two hundredths (324.42) feet to Sta. 43+24.42, thence on a 10° curve (radius 573.7 ft.) to the right, a distance of about two hundred eighty-two and sixty-seven hundredths (282.67) feet to Sta. 46+07.09, thence on a tangent course S. 46°54'E. a distance of about forty-eight and three tenths (48.3) feet to Sta. 46+55.36, thence on a 10° curve left (radius 573.7 ft.) a distance of about three hundred thirty-four and fifty-seven hundredths (334.57) feet to Sta. 49+89.93, thence on a tangent course S. 80°19'E. about sixty-three (63.0) feet to Sta. 50+52.93 a point supposed to be in the division line between land of F. D. Lambson and land of Warren D. Arnold.

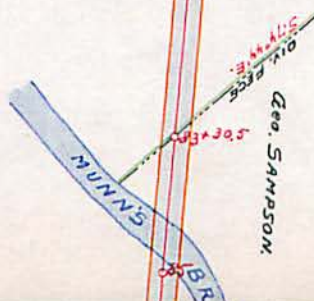
The above description is for the center line of location, the whole length on center line being about two thousand nine hundred forty and ninety-three (2940.93) feet. The width of land taken being one rod on the left or easterly and northerly side and from Sta. 40 or a distance of about one thousand fifty-two and ninety-three (1052.93) hundredths feet to Sta. 50+52.93 one rod on the right or southerly side of said location and from Sta. 21+12 to Sta. 40, a distance of about one thousand eight hundred eighty-eight (1888.0) feet, all the land southerly and westerly of said location line to Munns Brook. Containing five acres and sixty-five and eight tenths (5 acres 65.8) square rods more or less.

WARREN D. ARNOLD.

$R = 1146.22$ EX
Defl. $8^{\circ}20'$
5° Curve
 $RT = 72^{\circ}33.02$



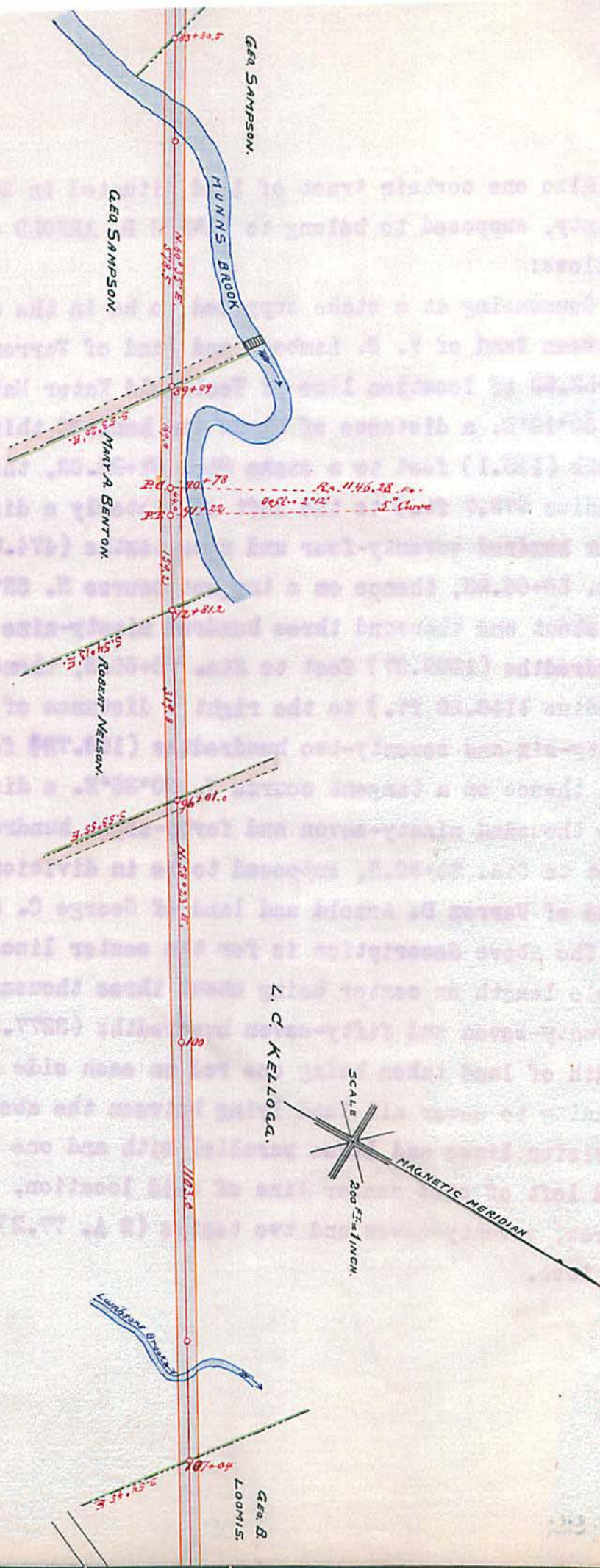
WARREN D. ARNOLD



Also one certain tract of land situated in Southwick in said County, supposed to belong to WARREN D. ARNOLD and described as follows:

Commencing at a stake supposed to be in the division line between land of F. D. Lambson and land of Warren D. Arnold, Sta. 50+52.93 of location line of Westfield Water Main, thence running S. $80^{\circ}19'E$. a distance of about one hundred thirty-nine and one tenth (139.1) feet to a stake Sta. 51+92.03, thence on a 10° curve (radius 573.7 ft.) to the left or easterly a distance of about four hundred seventy-four and nine tenths (474.9) feet to a stake Sta. 56+66.93, thence on a tangent course N. $52^{\circ}15'E$. a distance of about one thousand three hundred ninety-nine and thirty-seven hundredths (1399.37) feet to Sta. 70+66.3, thence on a 5° curve (radius 1146.28 ft.) to the right a distance of about one hundred sixty-six and seventy-two hundredths (166.72) feet to Sta. 72+33.02, thence on a tangent course N. $60^{\circ}35'E$. a distance of about one thousand ninety-seven and forty-eight hundredths (1097.48) feet to Sta. 83+30.5, supposed to be in division line between land of Warren D. Arnold and land of George C. Sampson.

The above description is for the center line of location, the whole length on center being about three thousand two hundred seventy-seven and fifty-seven hundredths (3277.57) feet. The width of land taken being one rod on each side of said center line meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of said location, containing two acres, seventy-seven and two tenths (2 A. 77.2) square rods more or less.



Also one certain tract of land situated in Southwick in said County supposed to belong to George C. Sampson, and described as follows:

Commencing at a stake supposed to be in the division line between land of Warren D. Arnold and land of George C. Sampson Sta. 83+30.5 on location line of Westfield Water Main and running N. 60°35'E. a distance of about five hundred seventy-eight and five tenths(578.5) feet to Sta. 89+09.0 a point supposed to be in division line between land of George C. Sampson and land of Mary A. Benton.

The above description is for the center line of said location, the whole length on center being about five hundred seventy-eight and five tenths (578.5) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of said location, containing about seventy and one tenth (70.1) square rods more or less.

Also one certain tract of land situated in Southwick in said County, supposed to belong to MARY A, BENTON, and described as follows:

Commencing at a stake supposed to be in the division line between land of George C. Sampson and land of Mary A. Benton, Sta. 89+09.0 on location line of Westfield Water Main and running N. 60°35'E. a distance of about one hundred sixty-nine (169.0) feet to a stake Sta. 90+78. Thence on a 5° curve (radius 1146.28 feet) to the left a distance of about forty-four (44.0) feet to a stake Sta. 91+22, thence on tangent course N. 58°23'E. a distance of about one hundred fifty-nine and two tenths (159.2) feet to stake Sta. 92+81.2 a point supposed to be in the division line between land of Mary A. Benton and land of Robert Nelson.

The above description is for the center line of said location, the whole length on center being about three hundred seventy-two and two tenths (372.2) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of location containing about forty-five and one tenth (45.1) square rods more or less.

Also one certain tract of land situated in Southwick in said County, supposed to belong to ROBERT NELSON, and described as follows:

Commencing at a stake supposed to be in the division line between land of Mary A. Benton and land of Robert Nelson, Sta. 92+81.2 of location line of Westfield Water Main, and running N. 58°23'E. a distance of about three hundred nineteen and eight tenths (319.8) feet, to a stake at Sta. 96+01.0 a point supposed to be in the division line between land of Robert Nelson and land of L. C. Kellogg.

The above description is for the center line of said location the whole length on center being about three hundred nineteen and eight tenths (319.8) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of said location, containing about thirty-eight and seven tenths (38.7) square rods more or less.

Also one certain tract of land, situated in Southwick in said County, supposed to belong to L. C. KELLOGG, and described as follows:

Commencing at a stake supposed to be in the division line between land of Robert Nelson and land of L. C. Kellogg, Sta. 96+01.0 on location line of Westfield Water Main and running N. 58° 23'E. a distance of about one thousand one hundred three (1103.0) feet to a stake at Sta. 107+04.0, a point supposed to be in the division line between land of L. C. Kellogg and land of George B. Loomis.

The above description is for the center line of said location the whole length on center being about eleven hundred three (1103.0) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of location containing about one hundred thirty-three and seven tenths (133.7) square rods more or less.

Also one certain tract of land, situated in Southwick in said County, supposed to belong to GEORGE B. LOOMIS, and described as follows:

Commencing at a stake supposed to be in the division line between land of L. C. Kellogg and land of George B. Loomis, Sta. 107+04 on locationline of Water Main, thence N. $58^{\circ}23'E$. a distance of about three hundred seventy-seven and five tenths (377.5) feet to stake at Sta. 110+81.5 a point supposed to be in the westerly line of Loomis Street.

The above description is for the center line of said location, the whole length on center line being about three hundred seventy seven and five tenths feet (377.5). The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division line and westerly line of Loomis Street, so called, and lines parallel with and one rod right and one rod left of said center line of said location, containing forty six and six tenths (46.6) square rods more or less.

Also one certain tract of land situated in Southwick in said County, supposed to belong to L. C. KELLOGG, and described as follows:

Commencing at a stake supposed to be in the easterly line of Loomis Street, so called, (Sta. 111+27.5 on the location line of Westfield Water Main and running N. 58° 23' E. a distance of about thirty-five and thirty-three hundredths (35.33) feet to a stake Sta. 111+62.83, thence on a 5° curve right (radius 1146.28 ft.) a distance of about one hundred thirty-six and five hundredths (136.05) feet to a stake Sta. 112+98.88, thence on a tangent course N. 65° 11' E. a distance of about sixteen and twelve hundredths (16.12) feet, to a stake Sta. 113+15, a point supposed to be in the division line between land of L. C. Kellogg and land of F. C. Kellogg.

The above description is for the center line of said location, the whole length on center line being about one hundred eighty-seven and five tenths (187.5) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the easterly line of Loomis Street, the above described division line and lines parallel with and one rod right and one rod left of said center line of said location, containing about twenty-two and seven tenths (22.7) square rods more or less.

Also one certain tract of land situated in Southwick in said County and supposed to belong to F. C. KELLOGG, ^{and} described as follows:

Commencing at a stake supposed to be in the division line between land of L. C. Kellogg and land of F. C. Kellogg, Sta. 113+15, on location line of Westfield Water Main, and running N.65° 11'E. a distance of about two hundred thirty-five (235.0) feet to a stake, Sta. 115+50, a point supposed to be in the division line between land of L. C. Kellogg and land of F. C. Kellogg.

The above description is for the center line of said location, the whole length on center line being about two hundred thirty-five (235.0) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of said location, containing twenty-eight and four tenths (28.4) square rods more or less.

Also one certain tract of land situated in Southwick in said County supposed to belong to L. C. KELLOGG, and described as follows:

Commencing at a stake supposed to be in the division line between land of F. C. Kellogg and land of L. C. Kellogg, Sta. 115 +50 on location line of Westfield Water Main, and running N. 65° 11'E. a distance of about two hundred ninety-five and seven tenths (295.7) feet to a stake, Sta. 118 +45.7 a point supposed to be in the division line between land of L. C. Kellogg and land of F. C. Kellogg.

The above description is for the center line of said location, the whole length on center line being about two hundred ninety-five and seven tenths (295.7) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described ^{division} lines and lines parallel with and one rod right and one rod left of said center line of location, containing about thirty-five and eight tenths (35.8) square rods more or less.

Also one certain tract of land situated in Southwick, in said County, supposed to belong to F. C. KELLOGG, and described as follows:

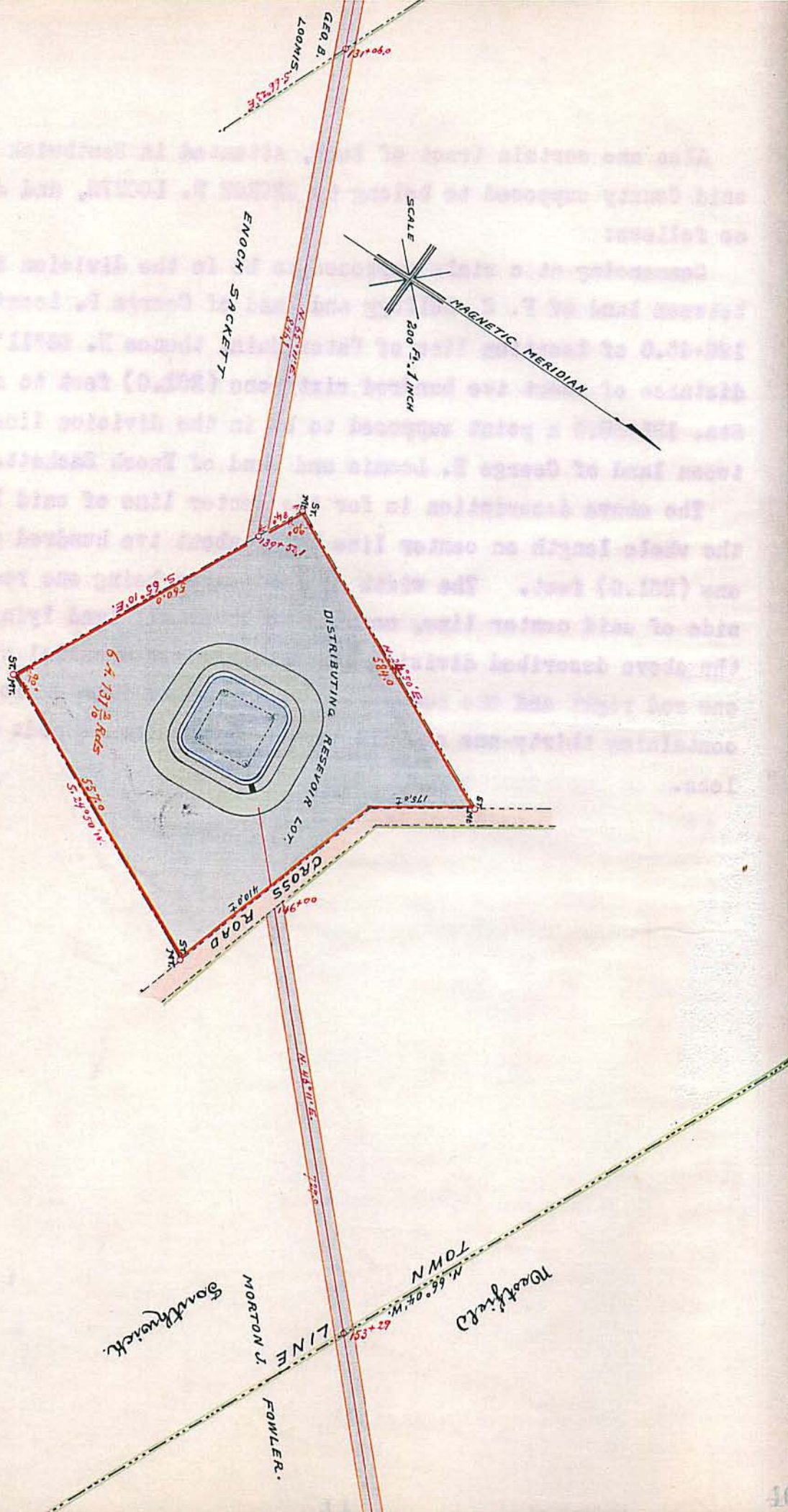
Commencing at a stake supposed to be in the division line between land of L. C. Kellogg and land of F. C. Kellogg, Sta. 118+45.7 on location line of Westfield Water Main and running N. 65°11'E. a distance of about nine hundred ninety-nine and three tenths (999.3) feet to a stake Sta. 128+45, a point supposed to be in the division line between land of F. C. Kellogg and land of George B. Loomis,

The above description is for the center line of said location the whole length on center line being about nine hundred ninety-nine and three tenths (999.3) feet. The width of land taken be- one rod on each side of said center line meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of location, containing about one hundred twenty-one and one tenth (121.1) square rods more or less.

Also one certain tract of land, situated in Southwick in said County supposed to belong to GEORGE B. LOOMIS, and described as follows:

Commencing at a stake supposed to be in the division line between land of F. C. Kellogg and land of George B. Loomis Sta. 128+45.0 of location line of Water Main, thence N. 65°11'E. a distance of about two hundred sixty-one (261.0) feet to a stake Sta. 131+06.0 a point supposed to be in the division line between land of George B. Loomis and land of Enoch Sackett.

The above description is for the center line of said location, the whole length on center line being about two hundred and sixty-one (261.0) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division lines, and lines parallel with and one rod right and one rod left of said center line of location, containing thirty-one and six tenths (31.6) square rods more or less.



Also one certain tract of land situated in Southwick, in said County supposed to belong to heirs of ENOCH SACKETT, and described as follows:

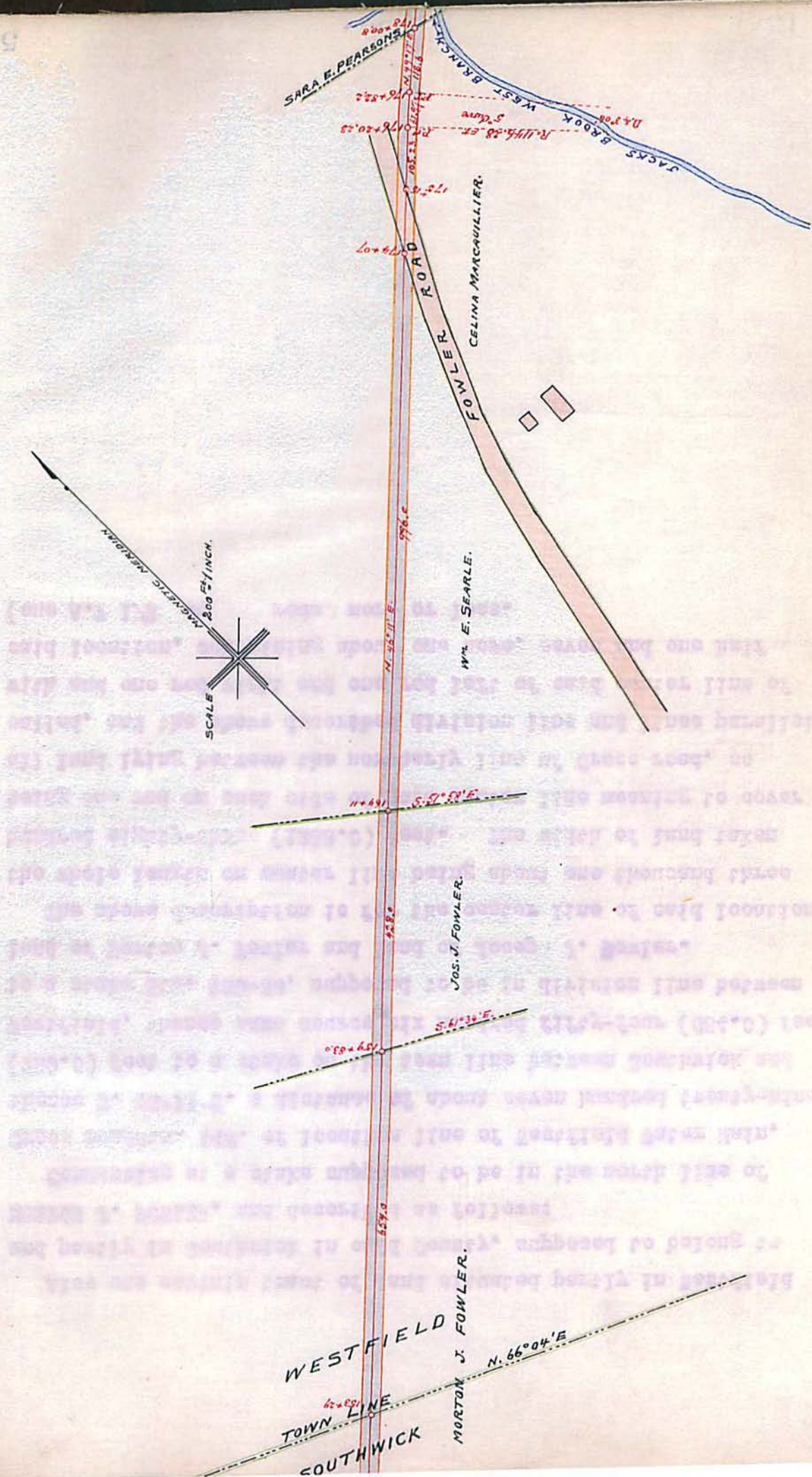
Commencing at a stake supposed to be in the division line between land of George B. Loomis and land of said Sackett, Sta. 131+06 on location line of Westfield Water Main, and running N. 65° 11'E. a distance of about eight hundred forty-six and one tenth (846.1) feet, to a stake Sta. 139+52.1 a point in the division line between land of said Sackett and land taken by Town of Westfield for Distributing Reservoir purposes.

The above description is for the center line of said location, the whole length on center line being about eight hundred forty-six and one tenth (846.1) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of location, containing about one hundred two and five tenths (102.5) square rods more or less.

Also one certain tract of land situated partly in Westfield and partly in Southwick in said County, supposed to belong to MORTON J. FOWLER, and described as follows:

Commencing at a stake supposed to be in the north line of Cross road Sta. 146. of location line of Westfield Water Main, thence N. 46°11'E. a distance of about seven hundred twenty-nine (729.0) feet to a stake on the town line between Southwick and Westfield, thence same course six hundred fifty-four (654.0) feet to a stake Sta. 159+83, supposed to be in division line between land of Morton J. Fowler and land of Joseph J. Fowler.

The above description is for the center line of said location, the whole length on center line being about one thousand three hundred eighty-three (1383.0) feet. The width of land taken being one rod on each side of said center line meaning to cover all land lying between the northerly line of Cross road, so called, and the above described division line and lines parallel with and one rod right and one rod left of said center line of said location, containing about one acre, seven and one half ^{square rods} (one A. 7 1/2 sq. rods) more or less.



Also one certain tract of land situated in Westfield in said County supposed to belong to JOSEPH J. FOWLER, and described as follows:

Commencing at a stake in the supposed division line between land of Morton J. Fowler and land of Joseph J. Fowler, Sta. 159+83 of locationline of Westfield Water Main thence N. $46^{\circ} 11' E.$ a distance of about four hundred twenty-eight (428.0) feet to Sta. 164+11 a point supposed to be in division line between land of Joseph J. Fowler and land of William E. Searle.

The above description is for the center line of location, the whole length on center line being about four hundred twenty-eight (428.0) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division lines, and lines parallel with and one rod right and one rod left of said center line of said location, containing about fifty-one and eight tenths (51.8) square rods more or less.

Also one certain tract of land situated in Westfield supposed to belong to WILLIAM E. SEARLE, and described as follows:

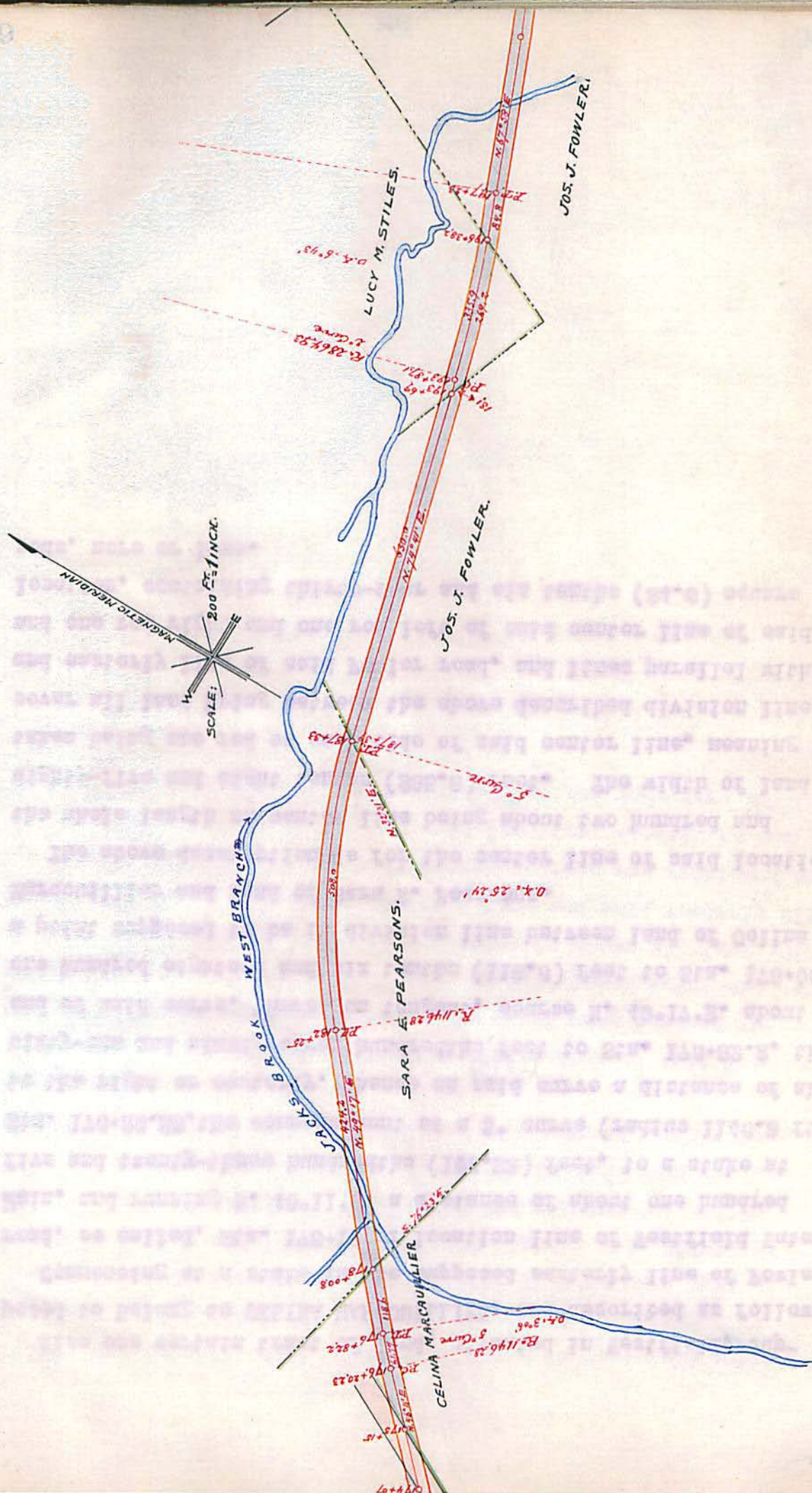
Commencing at a stake in the division line between land of Joseph J. Fowler and land of William E. Searle Sta. 164+11 of location line of Westfield Water Main and running N.40°11'E. a distance of about nine hundred ninety-six (996.0) feet to Sta. 174+07 a point supposed to be in westerly line of Fowler road, so called.

The above description is for the center line of said location, the whole length on center line being about nine hundred and ninety-six (996.0) feet. The width of land taken being one rod on each side of said center line meaning to cover all land lying between the above described division line and said westerly line of Fowler road and lines parallel with and one rod right and one rod left of said center line of said location, containing one hundred twenty and seven tenths (120.7) square rods more or less.

Also one certain tract of land, situated in Westfield, supposed to belong to CELINA MARCOUILLIER, and described as follows:

Commencing at a stake in the supposed easterly line of Fowler road, so called, Sta. 175+15 of location line of Westfield Water Main, and running N. $46^{\circ}11'E$. a distance of about one hundred five and twenty-three hundredths (105.23) feet, to a stake at Sta. 176+20.23, the commencement of a 5° curve (radius 1146.3 ft.) to the right or easterly, thence on said curve a distance of about sixty-one and ninety-seven hundredths ^(61.97) feet to Sta. 176+82.2, the end of said curve, thence on tangent, course N. $49^{\circ}17'E$. about one hundred eighteen and six tenths (118.6) feet to Sta. 178+00.8 a point supposed to be in division line between land of Celina Marcouillier and land of Sara E. Pearsons.

The above description is for the center line of said location, the whole length on center line being about two hundred and eighty-five and eight tenths ^(285.8) ~~feet~~. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division line and easterly line of said Fowler road, and lines parallel with and one rod right and one rod left of said center line of said location, containing thirty-four and six tenths (34.6) square rods, more or less.



Also one certain tract of land situated in Westfield in said County, supposed to belong to MRS. SARAH E. PEARSONS, and described as follows:

Commencing at a stake, supposed to be in the division line, between land of Celina Marcoullier and land of Mrs. Sarah E. Pearsons, Sta. 178+00.8 on location line of Westfield Water Main, and running N.49°17'E. a distance of about four hundred twenty-four and two tenths (424.2) feet, to a stake Sta. 182+25, the commencement of a 5° curve (radius 1146.3) feet to the right or easterly thence on said curve a distance of about five hundred eight (508.0) feet to Sta. 187+33 the end of said curve, thence on tangent course N.74°41'E. about six (6.0) feet to Sta. 187+39 a point supposed to be in the division line between land of Mrs. Sarah E. Pearsons and land of Joseph J. Fowler.

The above description is for the center line of location, the whole length on center being about nine hundred thirty-two and two tenths (932.2) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of location, containing about one hundred thirteen and seven tenths (113.7) square rods more or less.

Also one certain tract of land situated in Westfield in said County supposed to belong to JOSEPH J. FOWLER, and described as follows:

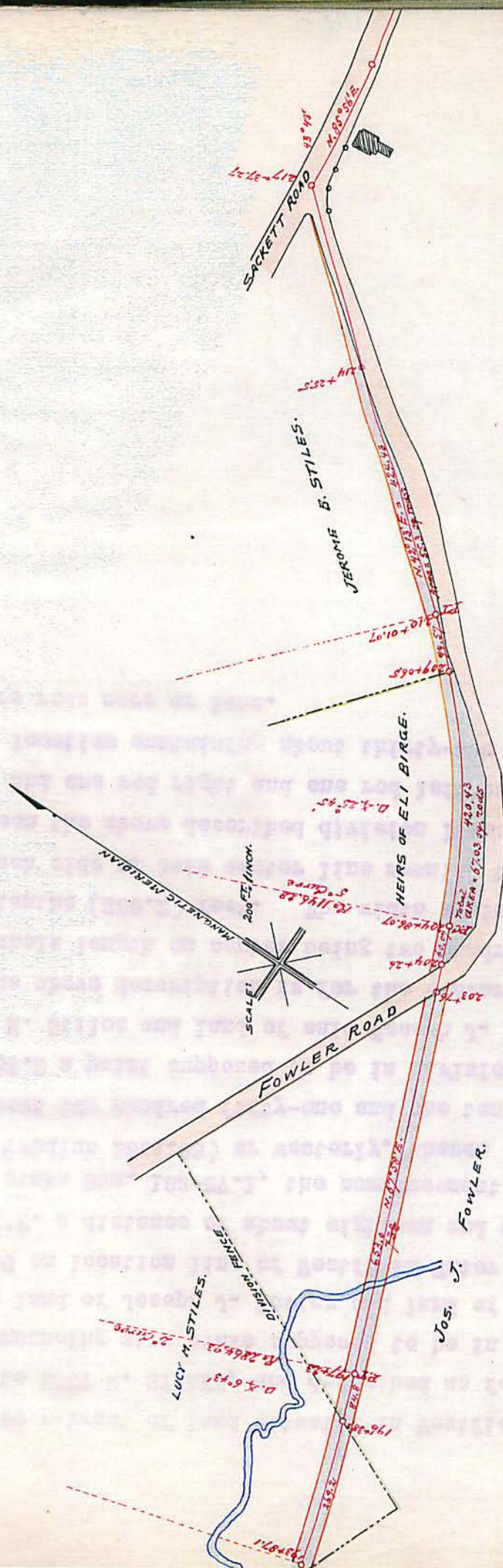
Commencing at a stake, supposed to be in the division line between land of Mrs. Sara E. Pearsons and land of Joseph J. Fowler Sta. 187+39 of location line of Westfield Water Main, thence N. $74^{\circ}41'E.$ a distance of about six hundred thirty (630.0) feet to Sta. 193+69 a point supposed to be in division line between land of Joseph J. Fowler and land of Lucy M. Stiles.

The above description is for the center line of said location, the whole length on center line being about six hundred and thirty (630) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of said location, containing about seventy six and three tenths (76.3) square rods more or less.

Also a tract of land situated in Westfield, supposed to belong to LUCY M. STILES, and described as follows:

Commencing at a stake supposed to be in the division line between land of Joseph J. Fowler and land of Lucy M. Stiles, Sta. 193+69 on location line of Westfield Water Main, and running N. $74^{\circ}41'E$. a distance of about eighteen and one tenth (18.1) feet to a stake Sta. 193+87.1, the commencement of a 2° curve to the left (radius 2864.93) or westerly, thence on said curve a distance of about two hundred fifty-one and one tenth (251.1) feet to Sta. 196+38.2 a point supposed to be in division line between land of Lucy M. Stiles and land of said Joseph J. Fowler.

The above description is for the center line of said location the whole length on center being two hundred and sixty-nine and two tenths (269.2) feet. The width of land taken being one rod on each side of said center line meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said center line of said location containing about thirty-two and six tenths (32.6) square rods more or less.



Also one certain tract of land situated in Westfield in said County, supposed to belong to JOSEPH J. FOWLER, and described as follows:

Commencing at a stake supposed to be in the division line between land of Lucy M. Stiles and land of Joseph J. Fowler, Sta. 196+38.2 of location line of Westfield Water Main, thence on a 2° curve (radius 2864.93ft.) to the left a distance of about eighty-four and eight tenths (84.8) feet to Sta. 197+23, thence N. 67°58'E. a distance of about six hundred fifty-three (653.0) feet to Sta. 203+76 a point supposed to be in the south line of Fowler road, so called.

The above description is for the center line of said location the whole length on center line being about seven hundred thirty-seven and eight tenths (737.8) feet. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described division line and southerly line of Fowler road and lines parallel with and one rod right and one rod left of said center line of said location, containing about eighty-nine and four tenths (89.4) square rods more or less.

Also one certain tract of land, situated in Westfield in said County, supposed to belong to the HEIRS of ELI BIRGE and described as follows:

Commencing at a stake supposed to be in the northerly line of Fowler road, so called, Sta. 204+26 of location line of Westfield Water Main and running N. $67^{\circ}58'E$. a distance of about sixty-and seven hundredths (60.07) feet, to a stake at Sta. 204+86.07, the commencement of a 5° curve (radius 1146.28) to the left or westerly, thence on said curve a distance of four hundred twenty and forty-three hundredths (420.43) feet to Sta. 209+06.5, a point supposed to be in division line between land of heirs of Eli Birge and land of Jerome B. Stiles.

* The above description is for the center line of location. The land taken includes all land lying between the westerly line of Fowler road, so called, the above described division line and a line parallel to and one rod distance to the left from the above described center line of said location, containing about sixty-seven square rods more or less. (67.0) sq. rods \pm

Also one certain tract of land situated in Westfield, in said County, supposed to belong to JEROME B. STILES, and described as follows:

Commencing at a stake, supposed to be in the division line between land of heirs of Eli Birge and land of Jerome B. Stiles, Sta. 209+06.5 on location line of Westfield Water Main and running on a 5° curve to the left or northerly (radius 1146.28 ft.) a distance of about ninety-four and fifty-seven hundredths (94.57) feet to a stake Sta. 210+01.07. Thence on a tangent course N. 42° 13' E. about four hundred twenty-four and forty-three hundredths (424.43) feet to Sta. 214+25.5 a point supposed to be in the western line of Fowler Road, so called.

The above description is for the center line of location, the whole length on center being about Five hundred nineteen (519.0) feet. The land taken includes all land lying between the above described division line, the westerly line of Fowler Road, and a line parallel to and one rod distance to the left from the above described center line of said location, containing about fifty-five and three tenths (55.3) square rods more or less.

Said Town of Westfield, by its Board of Water Commissioners, James H. Bryan, Frank S. Dewey Jr. and Charles A. Firth, for the purposes aforesaid, has taken and shall forever have the right to enter upon the tracts or parcels of land above described for the purpose of laying, maintaining, replacing and repairing water-mains and examining the condition thereof.

In witness whereof, we, the said James H. Bryan, Frank S. Dewey Jr. and Charles A. Firth, have hereunto set our hands this *first* day of *April* in the year of our Lord One Thousand Eight hundred and Ninety-eight.

(Signed)

In presence of

Chas. A. Oates

James H. Bryan
Frank S. Dewey Jr.
Charles A. Firth

DESCRIPTION OF LAND
taken for
DISTRIBUTING RESERVOIR.

Know all men that the Town of Westfield, in the County of Hampden and Commonwealth of Massachusetts, in the exercise of powers conferred by Chapter three hundred and forty-two of the Acts of the year Eighteen Hindred and Ninety-five, being an Act entitled, "An Act to authorize the Town of Westfield to increase its Water Supply," and approved April 30th.1895, has by its Board of Water Commissioners, for the purpose of supplying the inhabitants of said Town with pure water, for the extinguishment of fires and for domestic and other purposes, taken all the rights to the following described parcel of land the same to be used for the purposes of construction and use of a distributing reservoir.

A certain tract of land situated in Southwick in said County,^{and} supposed to belong to ^{*the devisee or estate of*} ~~heirs~~ of ENOCH SACKETT^{*deceased*}, and described as follows:

Commencing at a Stone Mt.at the south east corner of land taken and in the Westerly line of Cross road, so called, thence running S. 24°50'W. a distance of five hundred fifty-seven (557.0) feet to a Stone Mt.thence N. 65°10'W. a distance of five hundred sixty (560.0) feet to a Stone Mt., thence N. 24°50'E. a distance of five hundred eighty-four (584.0) feet to a Stone Mt. in westerly line of Cross road, thence on said westerly line of Cross road south-easterly a distance of about five hundred eighty five (585.0) feet to place of beginning, containing six acres one hundred thirty-one and two tenths (6A.131.2) square rods more or less.

The foregoing described parcel of land is supposed to belong to ^{*the devisee or estate of*} ENOCH SACKETT^{*deceased*}, and is surrounded by land of ^{*the devisee or estate of*} said ENOCH SACKETT.

Said Town of Westfield by its Board of Water Commissioners James H. Bryan, Frank S. Dewey Jr. and Charles A. Firth, for the purposes aforesaid, has taken all the rights to the above described tract of land.

In witness whereof, we, the said James H. Bryan, Frank S. Dewey Jr. and Charles A. Firth have hereunto set our hands this *first* day of *April* in the year of our Lord One Thousand Eight Hundred and Ninety-eight.

(Signed)

James H. Bryan
.....
Frank S. Dewey Jr.
.....
Charles A. Firth
.....

In presence of

Chas. H. Oakes
.....

Westfield Water Works.

Granville Supply.

Description of Land.

Know all Men, That the Town of Westfield, in the County of Hampden and Commonwealth of Massachusetts, in the exercise of powers conferred by Chapter three hundred and forty-two of the Acts of the Year Eighteen hundred and ninety-five, being an Act entitled "An Act to authorize the Town of Westfield to increase its Water Supply", and approved April 30th. 1895, has by its Water Commissioners for the purpose of supplying the inhabitants of said Town with pure water for the extinguishment of fires and for domestic and other purposes, taken the right to lay and maintain water mains and replace the same and keep the same in repair, within certain tracts or parcels of land, situated, bounded and described as follows:

One certain tract of land, situated in Westfield, in said County, supposed to belong to James A. Crane and Robert B. Crane and described as follows:

Commencing at a point in the northerly line of the highway leading from Cowle's Bridge, so called, to City View Boulevard at Sta. 271+69.69 of location line of Westfield Water Main, thence running N. 79° 27' E. a distance of four hundred thirty-eight and ninety-one one-hundredths (438.91) feet to a point Sta. 276+08.60 supposed to be in the westerly line of South Maple Street. The above described line is for the center line of location. The width of land taken being one rod on each side of said center line, meaning to cover all land lying between the above described highway lines and lines parallel with and one rod right and one rod left of said center line of location, containing about fifty-three and two tenths (53.2) square rods more or less.

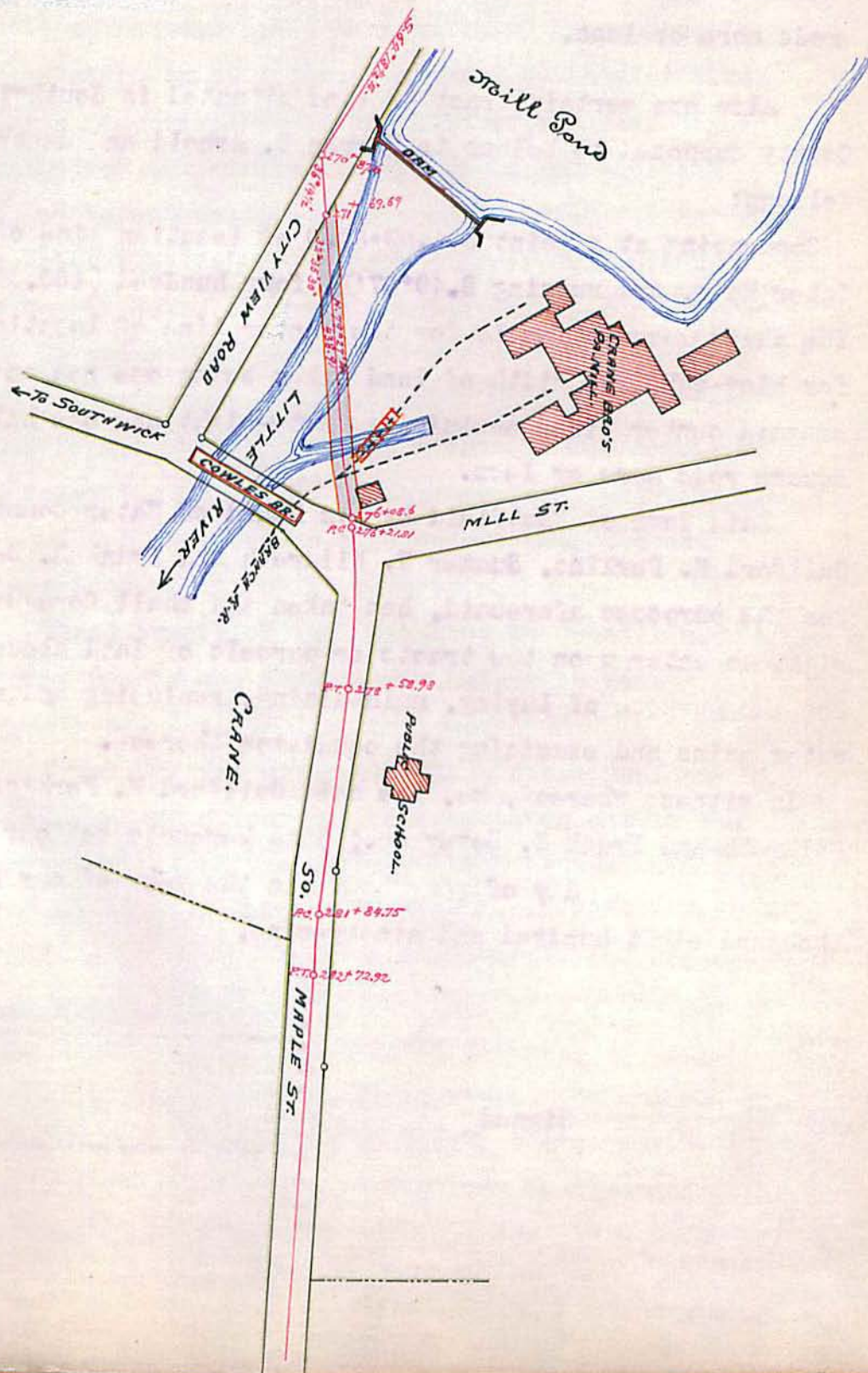
HAMPDEN COUNTY REGISTRY OF DEEDS.

JUN 6 1899

Received 9 H. 50 M. a.m.

Attest James R. Miles Register

1508



Open E. Parks.

Westfield Water Works.

Granville Supply.

Description of land taken for Intake Reservoir.

Know all Men, That the Town of Westfield, in the County of Hampden and Commonwealth of Massachusetts, in the exercise of powers conferred by Chapter three hundred and forty-two of the Acts of the Year Eighteen hundred and ninety-five being an act entitled "An Act to authorize the Town of Westfield to increase its Water Supply," and approved April 30th, 1895, has by its Board of Water Commissioners, for the purpose of supplying the inhabitants of said Town with pure water for the extinguishment of fires and for domestic and other purposes, taken all the rights to the following described parcels of land, the same to be used for the purpose of construction, use and maintenance of an intake reservoir.

Three tracts of land situated in Granville, in said County and supposed to belong to Henry Winchell and described as follows:

Tract No. I. Commencing at a stone monument at the south-east corner of the land taken and in the northerly line of the highway which passes said Winchell's house, thence running North $26^{\circ}50'$ East a distance of three hundred ninety-five and ninety-eight one-hundredths (395.98) feet to a stone monument, thence North $4^{\circ}22'$ West a distance of four hundred thirty-seven and fifty-eight one-hundredths (437.58) feet to a stone monument, thence North 42° West a distance of five hundred twenty-five and sixty-six one-hundredths (525.66) feet to a stone

monument, thence South $73^{\circ}22'$ West a distance of ninety-five and sixty-six one-hundredths (95.66) feet to a stone monument, thence same course about thirty (30) feet to the center of Tillotson Brook, so called, thence southerly along said Brook to the highway, thence easterly and northerly along said highway to place of beginning, containing six acres seventy-seven square rods (6A.77R.) more or less.

Tract No. 2. Commencing at a Butternut Tree at the south-west corner of land taken and in the northerly line of the highway which passes Winchell's house, thence running North $30^{\circ}15'$ East about thirty (30) rods, thence South $59^{\circ}45'$ East a distance of about ninety-eight (98) feet to the middle of Tillotson Brook, so called, thence Southerly along said brook to the highway thence westerly along said highway to place of beginning, containing one acre, fifteen square rods (1A.15R) more or less.

Tract No. 3. Commencing at the middle of Tillotson Brook, so called, and in the southerly line of the highway which passes Winchell's house at the north-west corner of land taken, thence running easterly along said highway a distance of about one hundred ten (110) feet, thence south $20^{\circ}30'$ East a distance of about two hundred thirty-one (231) feet to the middle of Tillotson Brook, thence westerly and northerly along said brook to place of beginning, containing sixty-five (65) square rods, more or less.

Tract No. 1 is a portion of land conveyed to Henry Winchell by A. W. Kellogg and C. K. Lambson

by deed dated March 22nd, 1862.

Tract No. 2 and tract No. 3 are same tracts as described in the deed of Luke Winchell to Henry Winchell, dated October 25th, 1867 and recorded in Hampden County, Mass., Registry of Deeds, Book 253, Page 597, and it is hereby intended to take all and the same land and all privileges and appurtenances mentioned and described in said deed.

Said Town of Westfield, by its Board of Water Commissioners, Guilford H. Perkins, Sumner W. Hildreth and Frank S. Dewey, Jr., for the purposes aforesaid has taken all the rights to the above described tracts of land.

In witness whereof, we, the said Guilford H. Perkins, Sumner W. Hildreth and Frank S. Dewey, Jr, have hereunto set our hands this *eight* day of *August* in the year of our Lord Nineteen Hundred.

Guilford H. Perkins.
(Signed) *Sumner W. Hildreth*
Frank S. Dewey, Jr.

In presence of

John E. Parker.

HAMPDEN COUNTY REGISTRY OF DEEDS.

AUG 8 1898

Received _____ H. _____ M. _____

Wm. N. Niles Register

Whereas, by chapter 342 of the Acts of the year 1895, the town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants to, from time to time, take and hold by purchase or otherwise and convey to any part of said town, among other waters, the waters of any streams, springs and water sources within the water shed of Munn's brook in Granville, and its tributaries and confluents, and all water rights connected therewith. Now Therefore, Know All Men By These Presents, That the said Town of Westfield, by virtue of and in exercise of, and in part execution of the powers conferred by said Act, hath, for the purpose of providing itself and its inhabitants with an additional supply of water taken and appropriated the ^{waters} water sources and springs of Tillotson brook and Japhet brook in said Granville; being brooks which are tributaries and confluents of said Munn's Brook; above the following points; Tillotson brook above a point where said town has erected an intake dam upon and across said Tillotson brook and constructed a reservoir for holding said waters, and Japhet brook above the point where said town has set an intake pipe in said Japhet brook. And, further, said town of Westfield hath, for the purposes aforesaid, taken and holds all the water rights connected with said Tillotson and Japhet brooks above said points of taking,

Meaning and intending hereby to take and taking the full right to divert said described waters and convey them by means of dams, aqueducts, conduits, pipes, and other suitable structures into and about said town of Westfield for the purposes aforesaid.

The said town has not now taken and does not now hold, under the provisions or by virtue of or authority of said Act any of the waters of Dickinson brook in Granville, or any of the tributaries or branches thereof except Japhet brook; or any other waters, waters of any pond or ponds, spring or springs, stream or streams, artesian or driven well or wells or filter gallery or galleries or water rights or water sources ~~connected therewith~~ within the limits of said town of Westfield than those herein expressly set forth as taken and held.

The town of Westfield now returns and will hereafter return to the Westfield River, or its tributaries, at a point or points within its town boundaries, by its sewers and drains, such of the waters above taken as may collect within or flow or run into its sewers and drains.

~~This statement and certificate is made and filed under the provisions of said Chapter 342 of the Acts of the year 1895 and Chapter of the Acts of the year 1901.~~

In Witness Whereof, and in behalf of said Town of Westfield the Water Commissioners of Said Town have hereunto set their hands this Sixth day of March 1901.

N. Perkins

Samuel W. Field
H. S. Dewey, Jr.

Water Commission-
ers of Westfield.

240

8 inhabitants of wife-
Waterbury

MAILED
MAR 28 1961
12 48 MEM
WATER SUPPLY

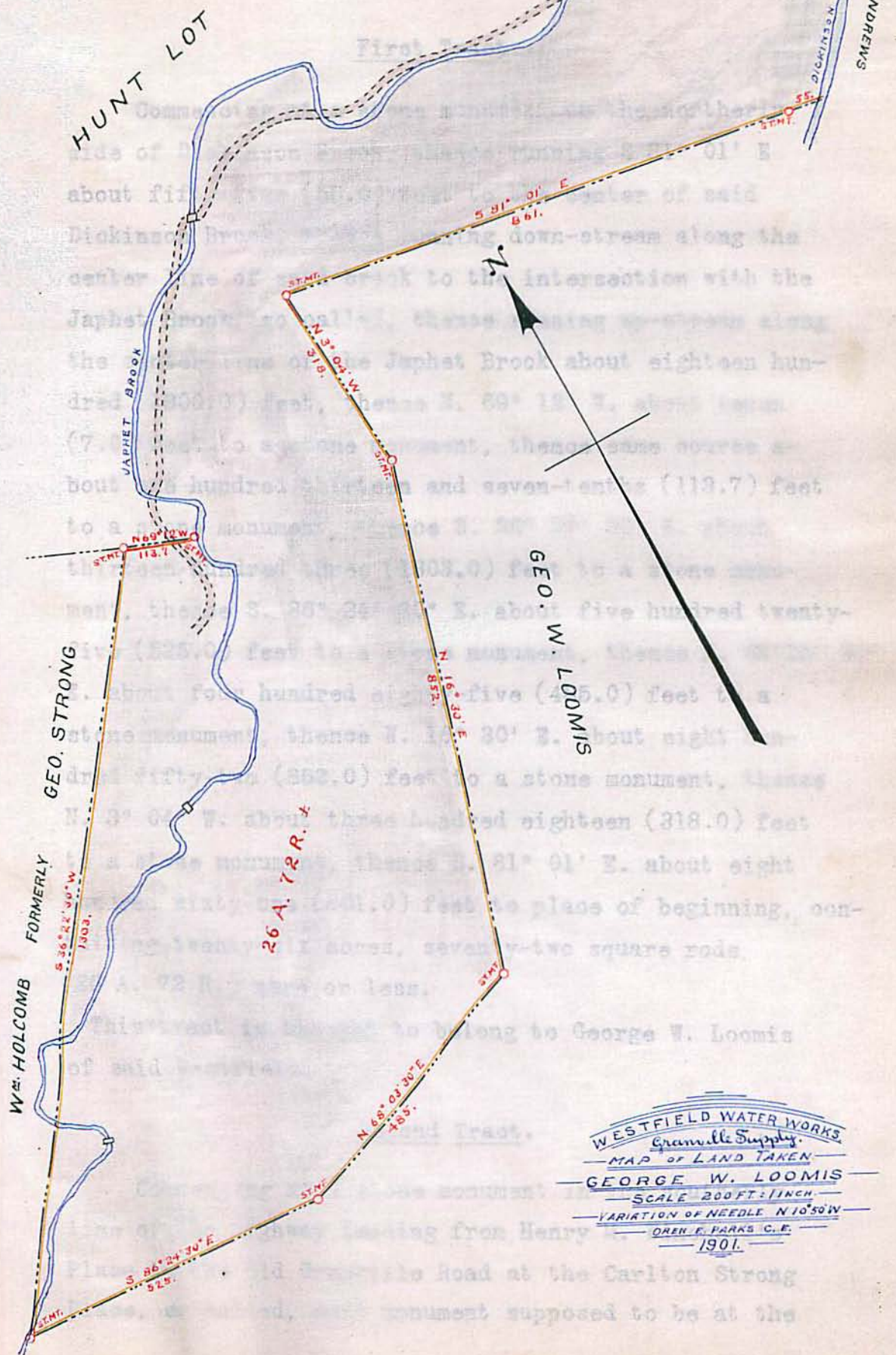
Recorded in Book 631. Page 122
Dated March 11, 1914

Resistor.

Whereas, by chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said act, and for effectually carrying out the objects of said act:-

Now, therefore, know All Men By These Presents, that the said town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said act, for the purpose of providing said town and its inhabitants with an additional supply of water, and for holding, storing, conveying, distributing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this fifteenth day of August, in the year nineteen hundred and one, taken, appropriated and holds the lands and property hereinafter described, together with any and all rights of way and easements which, in any wise, thereto appertain or belong.

Said lands and property are all situated in Granville in said County of Hampden, and are described as follows:-



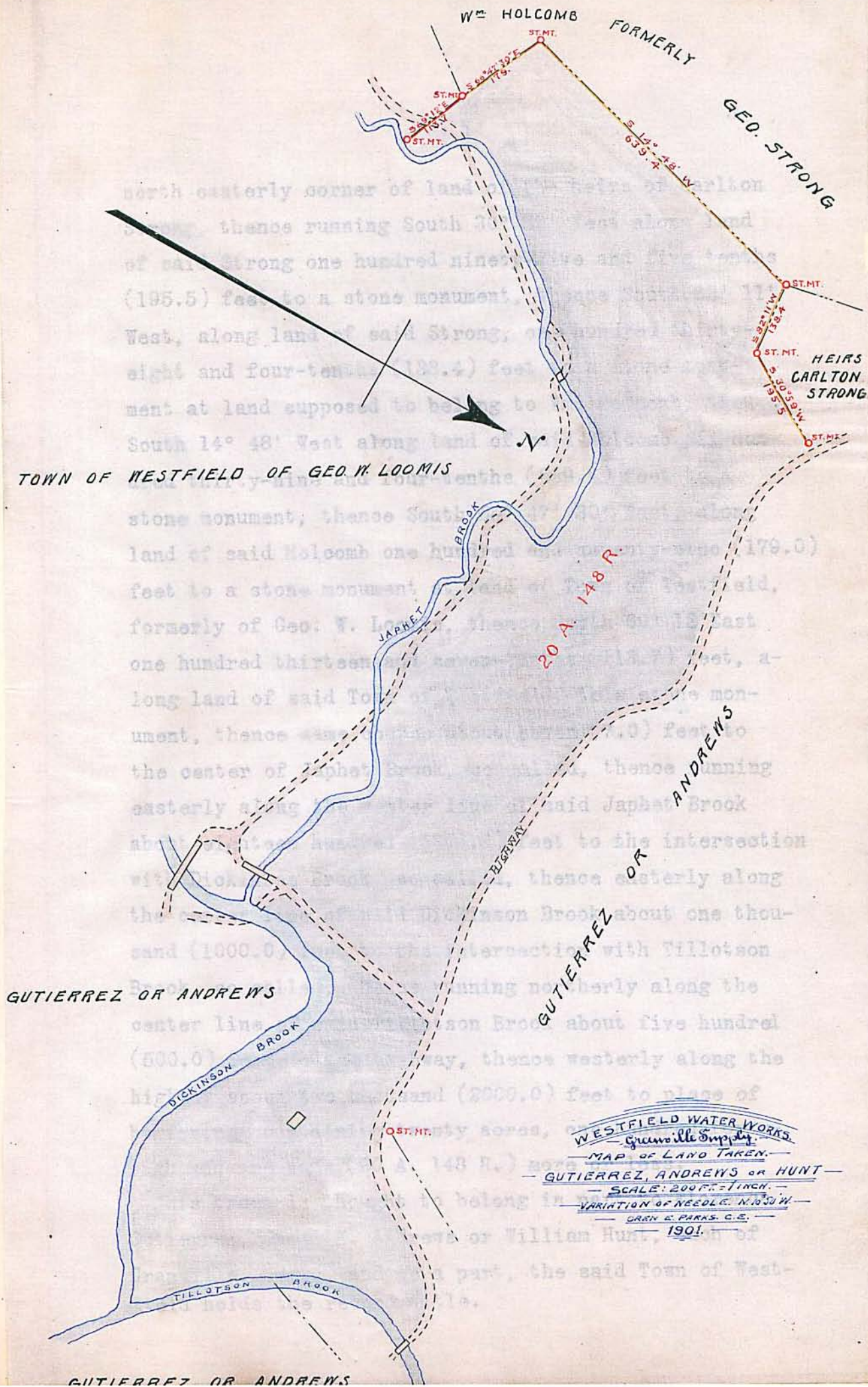
First Tract.

Commencing at a stone monument on the northerly side of Dickinson Brook, thence running S $81^{\circ} 01'$ E about fifty-five (55.0) feet to the center of said Dickinson Brook, thence running down-stream along the center line of said brook to the intersection with the Japhet Brook, so called, thence running up-stream along the center line of the Japhet Brook about eighteen hundred (1800.0) feet, thence N. $69^{\circ} 12'$ W. about seven (7.0) feet to a stone monument, thence same course about one hundred thirteen and seven-tenths (113.7) feet to a stone monument, thence S. $36^{\circ} 22' 30''$ W. about thirteen hundred three (1303.0) feet to a stone monument, thence S. $86^{\circ} 24' 30''$ E. about five hundred twenty-five (525.0) feet to a stone monument, thence N. $68^{\circ} 03' 30''$ E. about four hundred eighty-five (485.0) feet to a stone monument, thence N. $16^{\circ} 30'$ E. about eight hundred fifty-two (852.0) feet to a stone monument, thence N. $3^{\circ} 04'$ W. about three hundred eighteen (318.0) feet to a stone monument, thence S. $81^{\circ} 01'$ E. about eight hundred sixty-one (861.0) feet to place of beginning, containing twenty-six acres, seventy-two square rods (26 A. 72 R.) more or less.

This tract is thought to belong to George W. Loomis of said Westfield.

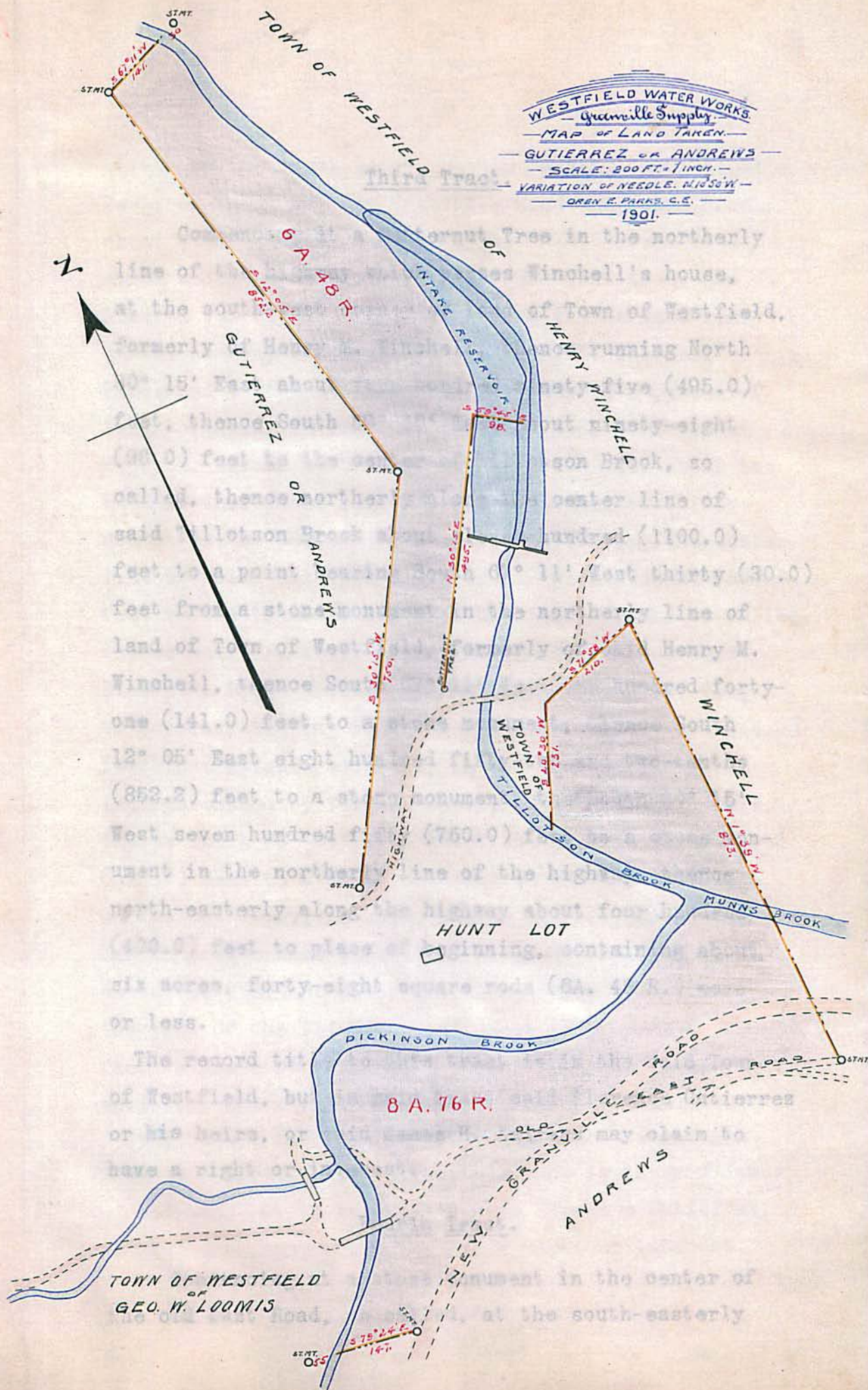
Second Tract.

Commencing at a stone monument in the southerly line of the highway leading from Henry M. Winchell's Place to the Old Granville Road at the Carlton Strong Place, so called, said monument supposed to be at the



north easterly corner of land of the heirs of Carlton Strong, thence running South $30^{\circ} 59'$ West along land of said Strong one hundred ninety-five and five tenths (195.5) feet to a stone monument, thence South $82^{\circ} 11'$ West, along land of said Strong, one hundred thirty-eight and four-tenths (138.4) feet to a stone monument at land supposed to belong to Wm. Holcomb, thence South $14^{\circ} 48'$ West along land of said Holcomb six hundred thirty-nine and four-tenths (639.4) feet to a stone monument, thence South $66^{\circ} 47' 30''$ East, along land of said Holcomb one hundred and seventy-nine (179.0) feet to a stone monument at land of Town of Westfield, formerly of Geo. W. Loomis, thence South $69^{\circ} 12'$ East one hundred thirteen and seven-tenths (113.7) feet, along land of said Town of Westfield, to a stone monument, thence same course about seven (7.0) feet to the center of Japhet Brook, so called, thence running easterly along the center line of said Japhet Brook about eighteen hundred (1800.0) feet to the intersection with Dickinson Brook, so called, thence easterly along the center line of said Dickinson Brook about one thousand (1000.0) feet to the intersection with Tillotson Brook, so called, thence running northerly along the center line of said Tillotson Brook about five hundred (500.0) feet to the highway, thence westerly along the highway about two thousand (2000.0) feet to place of beginning, containing twenty acres, one hundred forty-eight square rods (20 A. 148 R.) more or less.

This tract is thought to belong in part to Florence Gutierrez, James H. Andrews or William Hunt, each of Granville, Mass., and to a part, the said Town of Westfield holds the record title.



Third Tract.

Commencing at a Butternut Tree in the northerly line of the highway which passes Winchell's house, at the south-west corner of land of Town of Westfield, formerly of Henry M. Winchell, thence running North $30^{\circ} 15'$ East about four hundred ninety-five (495.0) feet, thence South $59^{\circ} 45'$ East about ninety-eight (98.0) feet to the center of Tillotson Brook, so called, thence northerly along the center line of said Tillotson Brook about eleven hundred (1100.0) feet to a point bearing South $67^{\circ} 11'$ West thirty (30.0) feet from a stone monument in the northerly line of land of Town of Westfield, formerly of said Henry M. Winchell, thence South $67^{\circ} 11'$ West one hundred forty-one (141.0) feet to a stone monument, thence South $12^{\circ} 05'$ East eight hundred fifty-two and two-tenths (852.2) feet to a stone monument, the^{nce} South $30^{\circ} 15'$ West seven hundred fifty (750.0) feet to a stone monument in the northerly line of the highway, thence north-easterly along the highway about four hundred (400.0) feet to place of beginning, containing about six acres, forty-eight square rods (6A. 48 R.) more or less.

The record title to this tract is in the said Town of Westfield, but in said tract said Florence Gutierrez or his heirs, or said James H. Andrews may claim to have a right or interest.

Fourth Tract.

Commencing at a stone monument in the center of the old East Road, so called, at the south-easterly

corner of the tract taken, thence running North $1^{\circ} 39'$ West, crossing the New Granville Road and Munns Brook, about eight hundred seventy-three (873.0) feet to a stone monument, thence South $71^{\circ} 58'$ West about two hundred ten (210.0) feet to a point in the East line of the highway which passes the Henry M. Winchell Place and at the north-easterly corner of a parcel of land belonging to the Town of Westfield, formerly of Henry M. Winchell, thence South $20^{\circ} 30'$ West about two hundred thirty-one (231.0) feet to center of Tillotson Brook, so called, thence southerly along the center line of said Tillotson Brook about three hundred (300.0) feet to the intersection with Dickinson Brook, so called, thence south-westerly along the center line of said Dickinson Brook about fourteen hundred (1400.0) feet to a point, bearing South $79^{\circ} 24'$ East fifty-five (55.0) feet from a stone monument, in the southerly line of land purchased by Town of Westfield of Geo. W. Loomis, thence south $79^{\circ} 24'$ East about one hundred forty-seven (147.0) feet to a stone monument on the easterly side of the New Granville Road, thence easterly along the New Granville Road about five hundred (500.0) feet to center of Old East Road, thence easterly along the center line of the Old East Road about five hundred (500.0) feet to place of beginning, containing eight acres, seventy-six square rods (8 A. 76 R.) more or less.

The record title to part of this tract is in said Town of Westfield, and to another part is in said James H. Andrews; but in said tract said Florence Gutierrez, or his heirs, may claim to have a right or interest.

In Witness Whereof, the said Town has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

J. M. Perkins.
L. W. Hildreth.
H. S. Dewey, Jr.

In Presence of

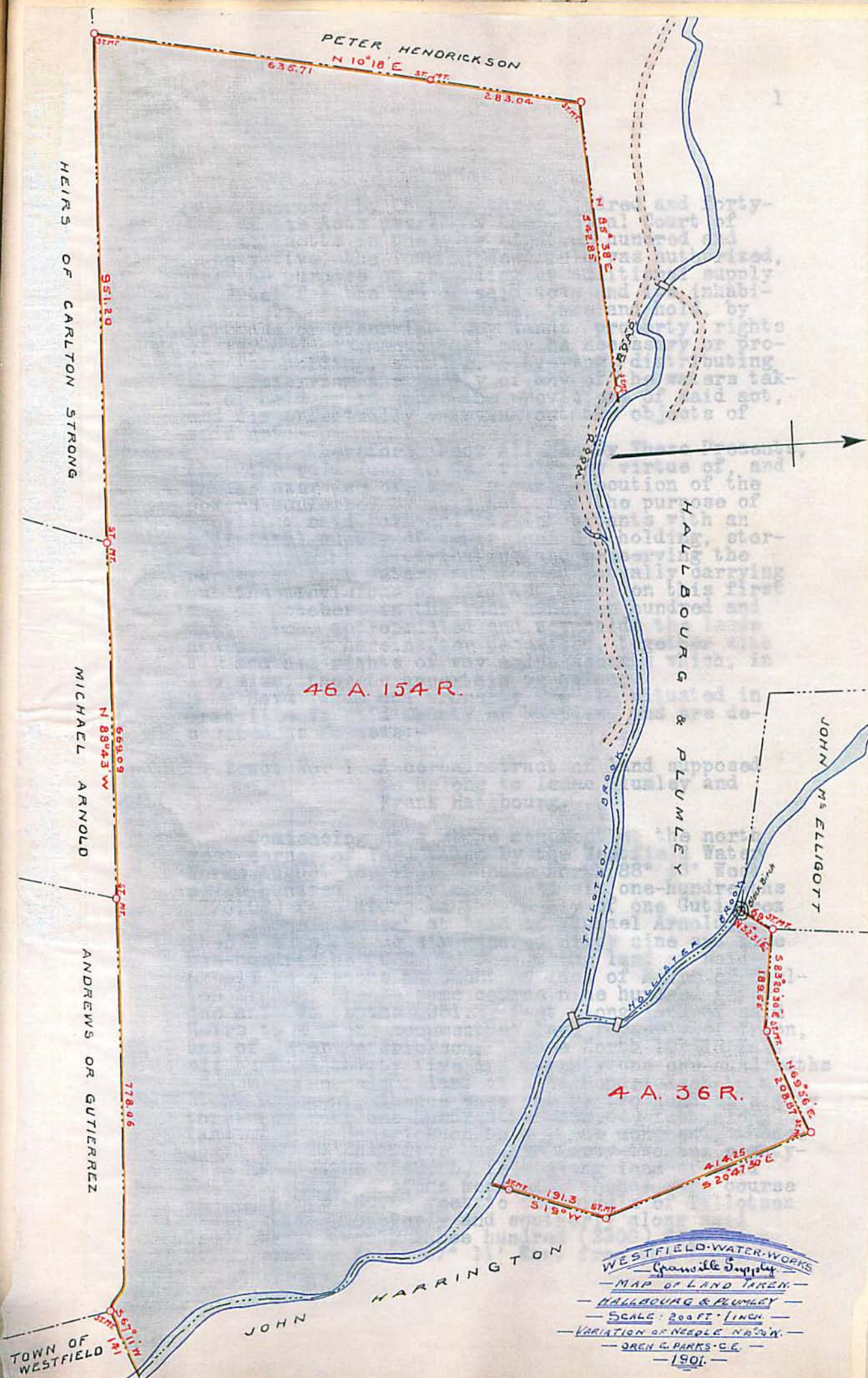
John E. Parks.

HAMPDEN COUNTY REGISTRY OF DEEDS.

SEP 26 1881

Received H. M.

7723



WESTFIELD-WATER-WORKS
 Granville Supply
 MAP OF LAND TAKEN
 - HALLBOURG & PLUMLEY -
 - SCALE: 200 FT. / INCH -
 - VARIATION OF NEEDLE N. & W. -
 - JOHN G. PARKS - C.E. -
 - 1901 -

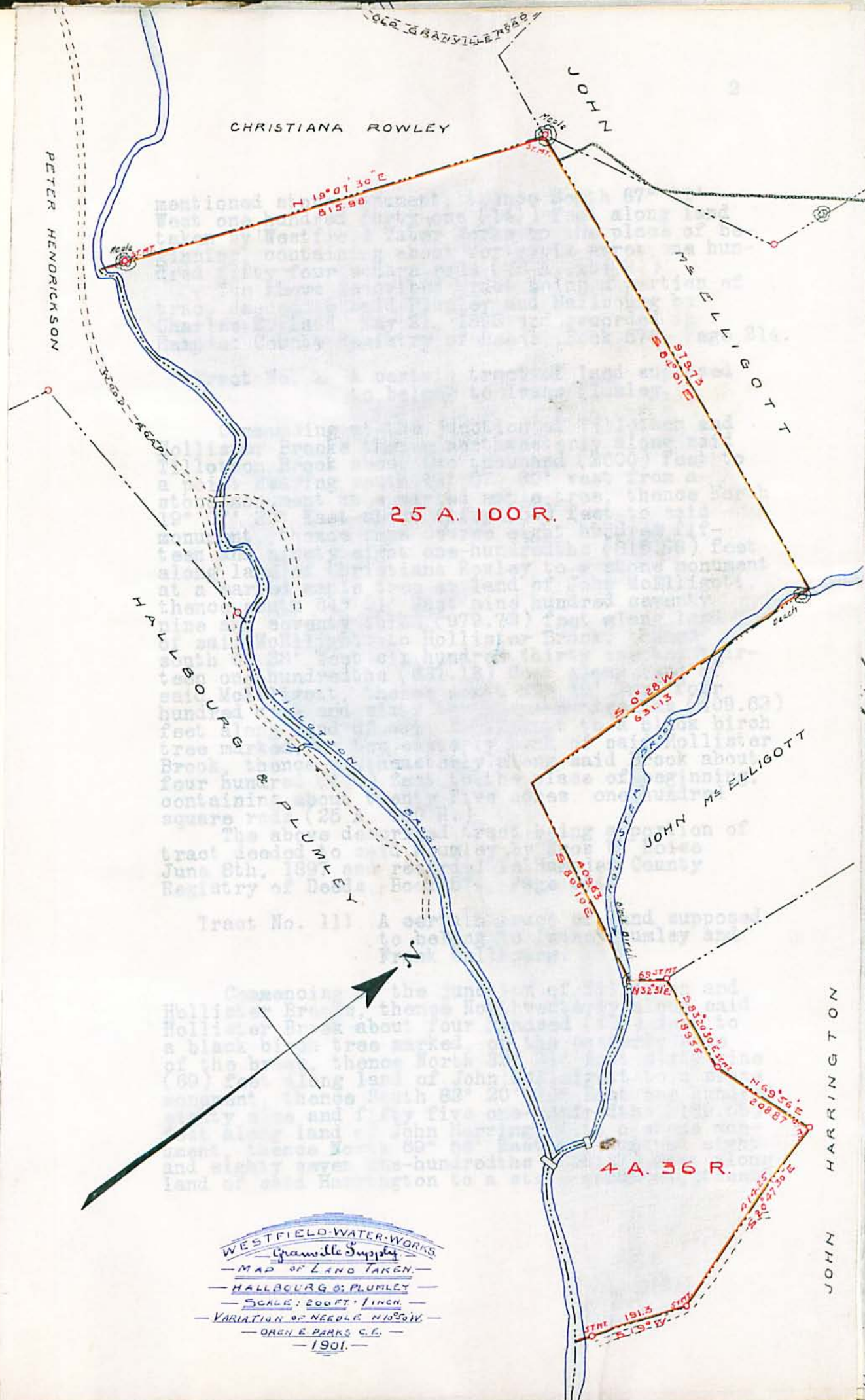
Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said act, and for effectually carrying out the objects of said act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of providing said town and its inhabitants with an additional supply of water, and for holding, storing, conveying, distributing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this first day of October, in the year nineteen hundred and one, taken, appropriated and now holds the lands and property hereinafter described, together with any and all rights of way and easements which, in any wise, thereto appertain or belong.

Said lands and property are all situated in Granville in said County of Hampden, and are described as follows:-

Tract No. 1. A certain tract of land supposed to belong to Isaac Plumley and Frank Hallbourg.

Commencing at a stone monument at the north west corner of land taken by the Westfield Water Works August 15, 1901; thence North $88^{\circ} 43'$ West seven hundred seventy eight and six one-hundredths (778.06) feet along land formerly of one Gutierrez to a stone monument at land of Michael Arnold, thence same course six hundred sixty nine and nine one-hundredths (669.09) feet along land of said Arnold to a stone monument at land of Heirs of Carlton Strong, thence same course nine hundred fifty one and two tenths (951.2) feet along land of said Heirs to a stone monument at land formerly of Tryon, and of Peter Hendrickson, thence North $10^{\circ} 18'$ East six hundred thirty five and seventy one one-hundredths (635.71) feet along land of said Hendrickson to a stone monument, thence same course two hundred eighty three and four one-hundredths (283.04) feet along land of said Hendrickson to a stone monument, thence North $85^{\circ} 38'$ East five hundred forty-two and eighty-five hundredths (542.85) feet along land of said Hendrickson to a stone monument, thence same course about thirty (30.0) feet to the middle of Tillotson Brook, thence easterly and southerly along said Brook about twenty three hundred (2300) feet to a point bearing North $67^{\circ} 11'$ East from the first



mentioned stone monument, thence South $67^{\circ} 11'$ West one hundred forty-one (141) feet along land taken by Westfield Water Works to the place of beginning, containing about forty-six acres one hundred fifty four square rods (46 A. 154 R.)

The above described tract being a portion of tract deeded to said Plumley and Hallbourg by Charles E. Ladd, May 21, 1898 and recorded in Hampden County Registry of Deeds, Book 578, Page 214.

Tract No. 2. A certain tract of land supposed to belong to Isaac Plumley.

Commencing at the junction of Tillotson and Hollister Brooks thence northwesterly along said Tillotson Brook about two thousand (2000) feet to a point bearing south $19^{\circ} 07' 30''$ west from a stone monument at a marked maple tree, thence North $19^{\circ} 07' 30''$ East about fifty (50) feet to said monument, thence same course eight hundred fifteen and ninety eight one-hundredths (815.98) feet along land of Christiana Rowley to a stone monument at a marked maple tree at land of John McElligott, thence south $84^{\circ} 01'$ East nine hundred seventy nine and seventy three ^{one hundredths} (979.73) feet along land of said McElligott to Hollister Brook, thence south $0^{\circ} 28'$ West six hundred thirty one and thirteen one-hundredths (631.13) feet along land of said McElligott, thence south $80^{\circ} 10'$ East four hundred nine and sixty three one-hundredths (409.63) feet along land of said McElligott to a black birch tree marked, on the easterly bank of said Hollister Brook, thence southeasterly along said Brook about four hundred (400) feet to the place of beginning, containing about twenty five acres, one hundred square rods (25 A. 100 R.)

The above described tract being a portion of tract deeded to said Plumley by Enos W. Boise June 8th, 1897 and recorded in Hampden County Registry of Deeds, Book 574, Page 344.

Tract No. 111. A certain tract of land supposed to belong to Isaac Plumley and Frank Hallbourg.

Commencing at the junction of Tillotson and Hollister Brooks, thence Northwesterly along said Hollister Brook about four hundred (400) feet to a black birch tree marked, on the easterly side of the brook, thence North $32^{\circ} 31'$ East sixty nine (69) feet along land of John McElligott to a stone monument, thence South $83^{\circ} 20' 30''$ East one hundred eighty nine and fifty five one-hundredths (189.55) feet along land of John Harrington to a stone monument, thence North $69^{\circ} 56'$ East two hundred eight and eighty seven one-hundredths (208.87) feet along land of said Harrington to a stone monument, thence

WESTFIELD-WATER-WORKS
—Granville Supply.

Granville Supply

- MAP OF LAND TAKEN

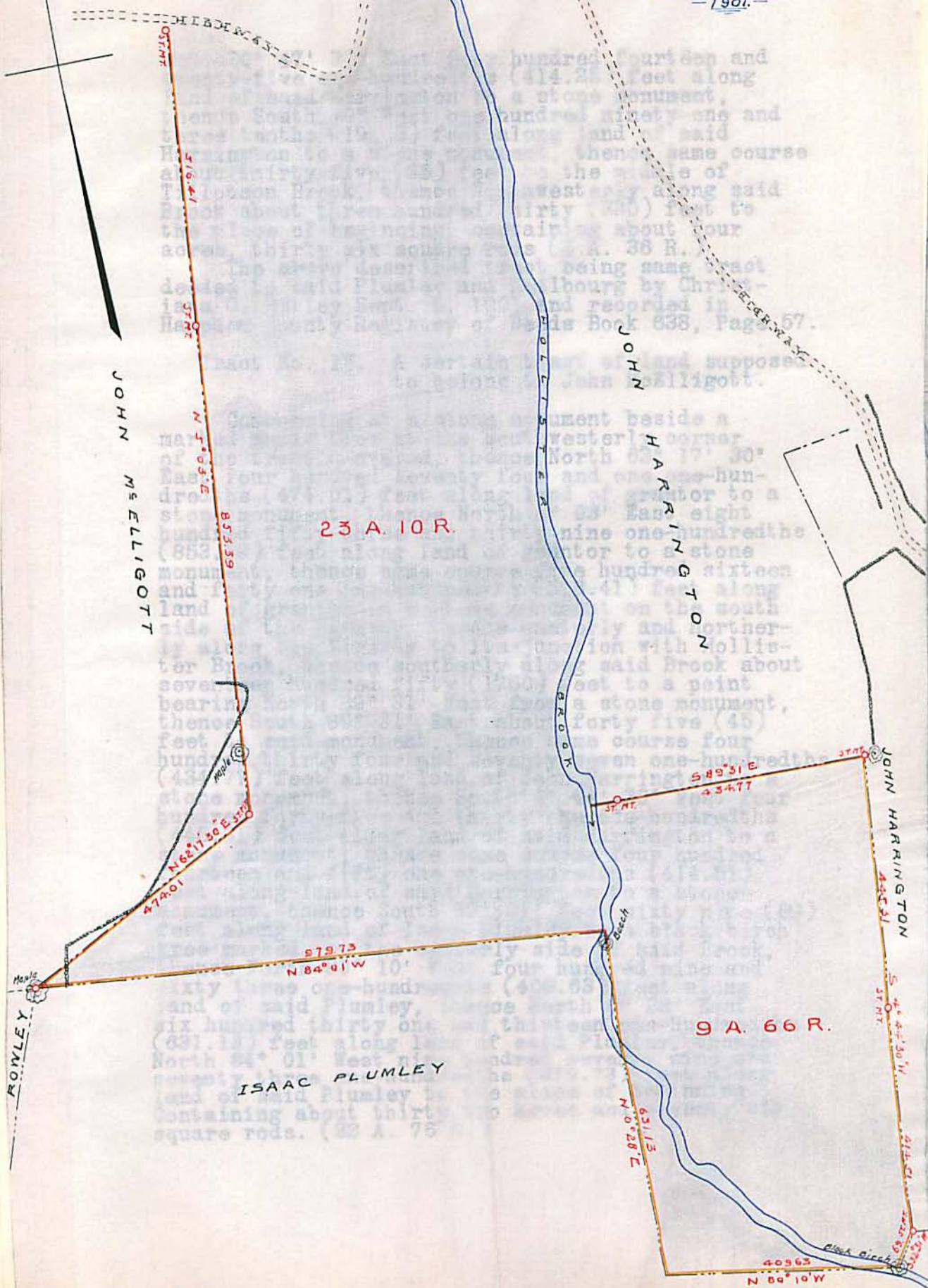
— JOHN M^E ELLIGOTT —

SCALE: 200 FT. / INCH.

VARIATION OF NEEDLE N $10^{\circ}50'N$.

— OREN C. PARKS, C.E. —

— 1901. —



South $20^{\circ} 47' 30''$ East four hundred fourteen and twenty-five one-hundredths (414.25) feet along land of said Harrington to a stone monument, thence South 19° West one hundred ninety-one and three tenths (191.3) feet along land of said Harrington to a stone monument, thence same course about thirty five (35) feet to the middle of Tillotson Brook, thence Northwesterly along said Brook about three hundred thirty (330) feet to the place of beginning, containing about four acres, thirty six square rods (4 A. 36 R.)

The above described tract being same tract deeded to said Plumley and Hallbourg by Christina G. Rowley Sept. 5, 1901 and recorded in Hampden County Registry of Deeds Book 638, Page 57.

Tract No. 1V. A certain tract of land supposed to belong to John McElligott.

Commencing at a stone monument beside a marked maple tree at the southwesterly corner of the tract conveyed, thence North $62^{\circ} 17' 30''$ East four hundred seventy four and one one-hundredths (474.01) feet along land of grantor to a stone monument, thence North $5^{\circ} 03'$ East eight hundred fifty-three and thirty nine one-hundredths (853.39) feet along land of grantor to a stone monument, thence same course five hundred sixteen and forty one one-hundredths (516.41) feet along land of grantor to a stone monument on the south side of the Highway, thence easterly and northerly along the Highway to its junction with Hollister Brook, thence southerly along said Brook about seventeen hundred fifty (1750) feet to a point bearing North $89^{\circ} 31'$ West from a stone monument, thence South $89^{\circ} 31'$ East about forty five (45) feet to said monument, thence same course four hundred thirty four and seventy seven one-hundredths (434.77) feet along land of John Harrington to a stone monument, thence South $4^{\circ} 44' 30''$ West four hundred forty-five and thirty one one-hundredths (445.31) feet along land of said Harrington to a stone monument, thence same course four hundred fourteen and fifty one one-hundredths (414.51) feet along land of said Harrington to a stone monument, thence South $32^{\circ} 31'$ West sixty nine (69) feet along land of Isaac Plumley to a black birch tree marked, on the easterly side of said Brook, thence North $80^{\circ} 10'$ West four hundred nine and sixty three one-hundredths (409.63) feet along land of said Plumley, thence North $0^{\circ} 28'$ East six hundred thirty one and thirteen one-hundredths (631.13) feet along land of said Plumley, thence North $84^{\circ} 01'$ West nine hundred seventy nine and seventy three one-hundredths (979.73) feet along land of said Plumley to the place of beginning. Containing about thirty two acres and seventy six square rods. (32 A. 76 R.)

The above described tract being a portion of tract deeded to said McElligott by Sidney A. Clark and Mary D. Clark, April 12th, 1898 and recorded in Hampden County Registry of Deeds, Book 576, Page 55.

In Witness Whereof, the said Town has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

G. W. Perkins.
S. W. Hildreth
F. S. Dewey, Jr.

In presence of

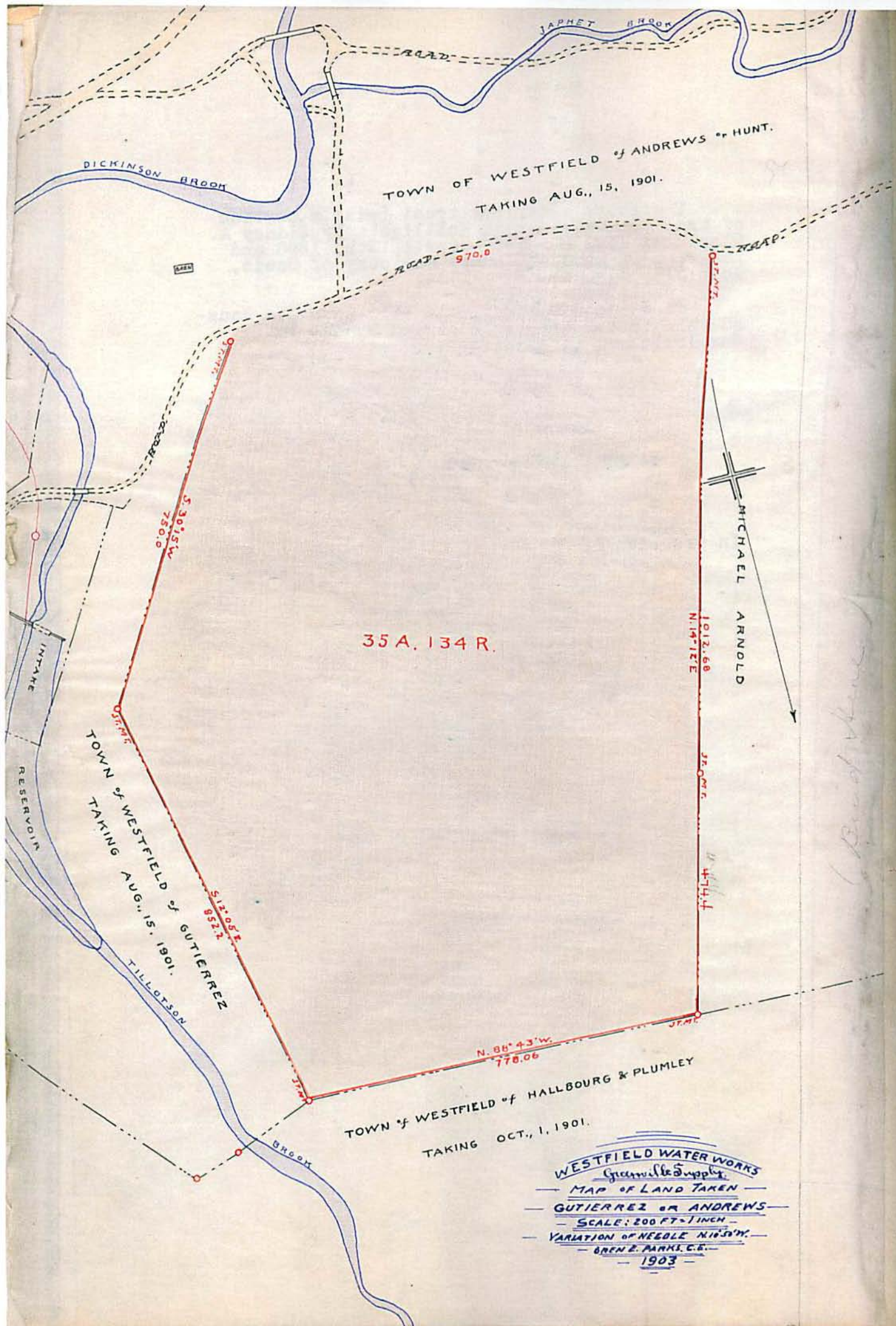
G. T. Snow

9969

HAMPDEN COUNTY REGISTRY OF DEEDS.

DEC 16 1901

Received 11 H. 5 M. a.m.,



Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said act, for the purpose of providing said town and its inhabitants with an additional supply of water, and for holding, storing, conveying, distributing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this tenth day of March, in the year nineteen hundred and three, taken, appropriated and now holds the lands and property hereinafter described, together with any and all rights of way and easements which, in any wise, there-to appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument on the northerly side of the highway which passes Winchell's house and at the southwest corner of land taken by Town of Westfield of James H. Andrews by taking filed in Hampden County, Mass. Registry of Deeds, Sept. 26, 1901, thence westerly along said highway about nine hundred seventy (970) feet to a stone monument at the southeasterly corner of land supposed to belong to Michael Arnold, thence North $14^{\circ} 12'$ East along land of said Arnold ten hundred twelve and sixty-eight one-hundredths (1012.68) feet to a stone monument, thence same course along land of said Arnold four hundred seventy-four and four tenths (474.4) feet to a stone monument at land taken by Town of Westfield of Hallbourg and Plumley by taking filed in Hampden County, Mass. Registry of Deeds, Dec. 16, 1901, thence South $88^{\circ} 43'$ East along land of said Town seven hundred seventy-eight and six one-hundredths (778.06) feet to a stone monument at the northwest corner of land taken of said Andrews, thence South $12^{\circ} 05'$ East along said land taken of Andrews eight hundred fifty-two and two tenths (852.2) feet to a stone monument, thence South $30^{\circ} 15'$ West along said land taken of Andrews seven hundred fifty (750) feet to the place of beginning, containing about thirty-five acres one hundred thirty four square rods (35 A. 134 R.) more or less.

The record title to this tract is in the said Town of Westfield, but in said tract one Florence Gutierrez or his heirs, or one James H. Andrews may claim to have a right or interest.

In Witness Whereof, the said Town has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

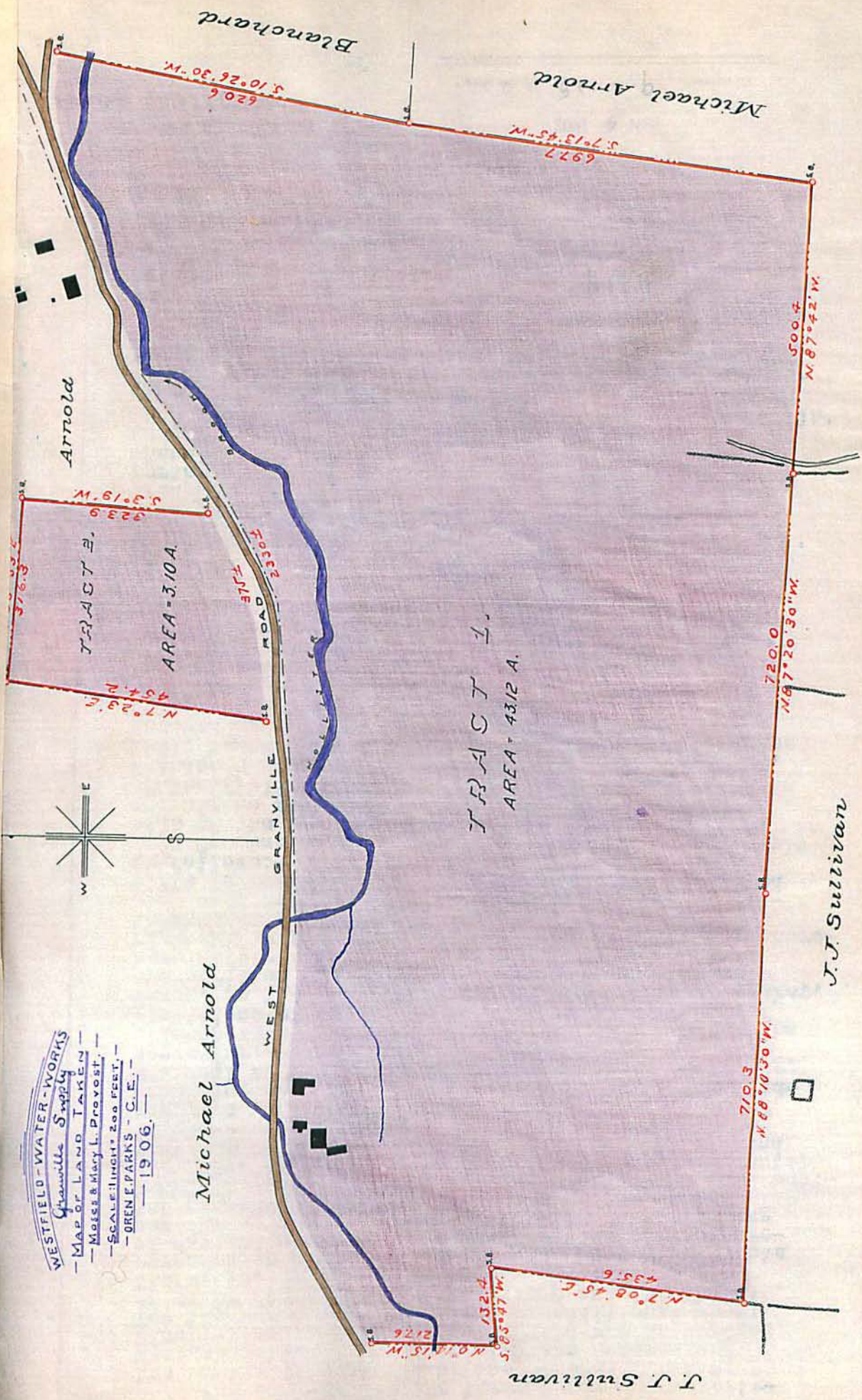
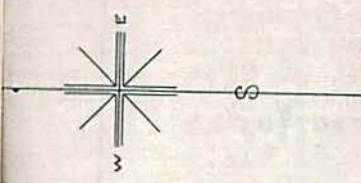
L. W. Winchell
Frank B. Dewey Jr
J. N. Perkins

In the presence of

The words "and for effectually carrying out the objects of said act" being added by execution.
Attest: Owen E. Parks.

Owen E. Parks

WESTFIELD-WATER-WORKS
 Chamville Supply
 - MAP OF LAND TAKEN -
 - MOSES & MARY L. PROVOST -
 - SCALE: LENGTH 200 FEET -
 - ORENE PARKS - C. E. -
 - 1906.



("PROVOST")

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said act, and for effectually carrying out the objects of said act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said act, for the purpose of providing said town and its inhabitants with an additional supply of water, and for holding, storing, conveying, distributing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this second day of July, in the year 1906, taken, appropriated and now holds the lands and property hereinafter described, together with any and all rights of way and easements which, in any-wise, thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract Commencing at a stone monument on the southerly side of the
 #1. West-Granville Road about four hundred fifty feet westerly of its junction with the Wild-Cat Road and in the division line between land of Provost and land supposed to belong to one Blanchard, thence South 10° 26' 30" West along land supposed to belong to said Blanchard six hundred twenty and six tenths (620.6) feet to a stone monument at land of Michael Arnold, thence South 7° 13' 45" West along land of said Arnold six hundred ninety-seven and seven tenths (697.7) feet to a stone monument at land supposed to belong to J. J. Sullivan, thence North 87° 42' West five hundred and four tenths (500.4) feet to a stone monument, thence North 87° 20' 30" West seven hundred twenty (720.0) feet to a stone monument, thence North 88° 10' 30" West seven hundred ten and three tenths (710.3) feet to a stone monument, thence North 7° 8' 45" East four hundred thirty-five and six tenths (435.6) feet to a stone monument, thence South 85° 47' West one hundred thirty-two and four tenths (132.4) feet to a stone monument, thence North 00° 14' 15" West two hundred seventeen and six tenths (217.6) feet to a stone monument on the southerly side of the West-Granville Road (The foregoing six courses are along land supposed to belong to J. J. Sullivan), thence north-easterly along said road about twenty-three hundred thirty (2330) feet to place of beginning, containing about 43.12 acres.

Tract Commencing at a stone monument on the northerly side of the West-
 #2. Granville Road, about eleven hundred feet north-easterly of the last mentioned monument in the description of tract #1, at south-westerly of the tract taken, thence North 7° 23' East four hundred fifty-four and two tenths (454.2) feet to a stone monument, thence South 85° 53' East three hundred sixteen and three tenths (316.3) feet to a stone monument, thence South 3° 19' West three hundred twenty-three and nine tenths (323.9) feet to a stone monument on the northerly side of the West-Granville Road, thence south-westerly along said road about three hundred seventy-five feet to the place of beginning, containing about 3.1 acres.

The two foregoing described tracts are supposed to belong to Moses and Mary Louise Provost of said Granville.

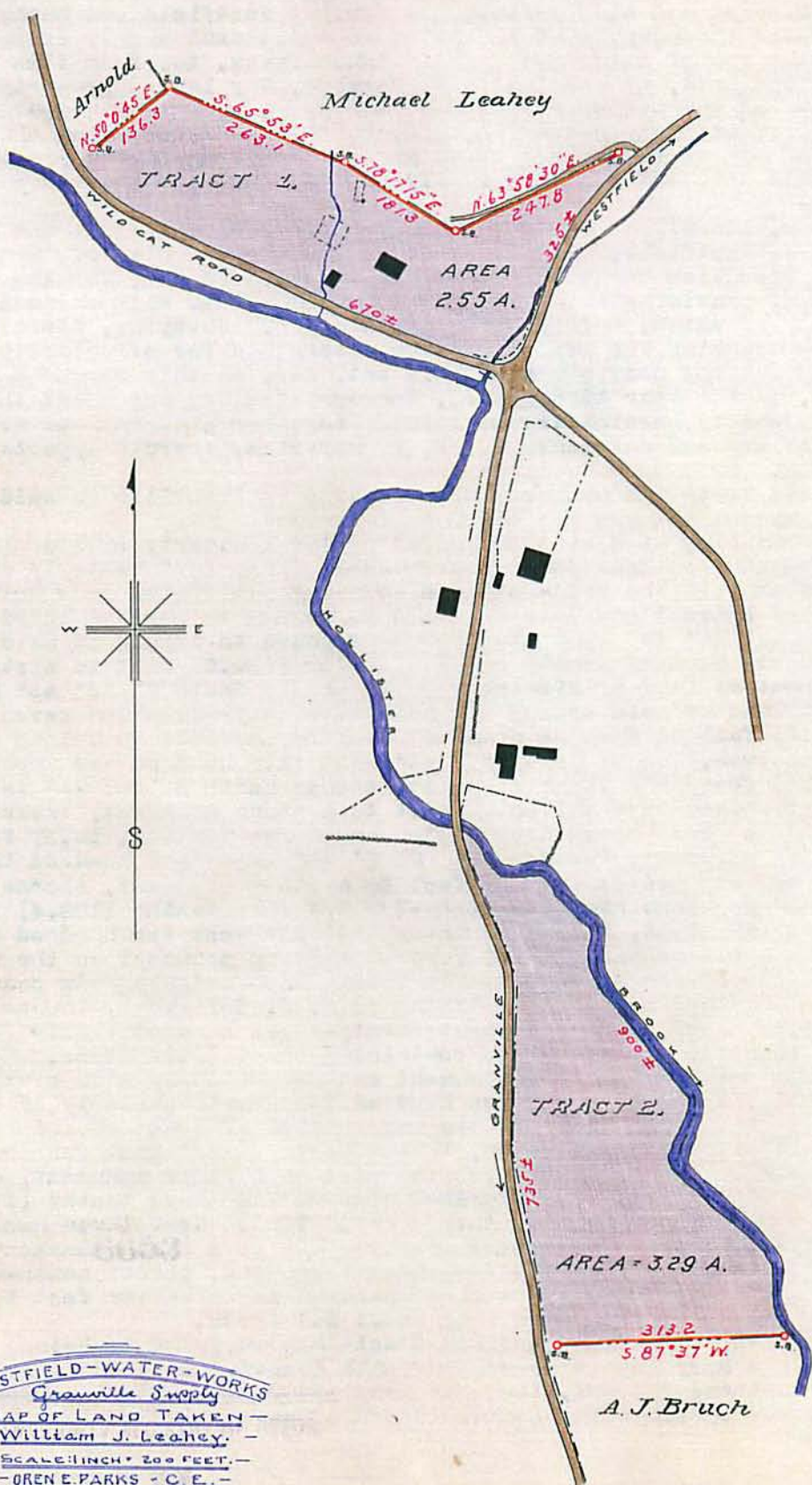
In Witness Whereof, the said Town has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
 Water Commissioners.

L. W. Gilduff
Thos Little
J. B. Packard

In the presence of

Orin E. Parks



WESTFIELD-WATER-WORKS
 Granville Supply
 - MAP OF LAND TAKEN -
 - William J. Leahey. -
 - SCALE: 1 INCH = 200 FEET. -
 - OREN E. PARKS - C. E. -
 - 1906. -

3-62-6m

(Wm. J. Leahey)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said act, and for effectually carrying out the objects of said act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said act, for the purpose of providing said town and its inhabitants with an additional supply of water, and for holding, storing, conveying, distributing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this second of July, in the year 1906, taken, appropriated and now holds the lands and property hereinafter described, together with any and all rights of way and easements which, in any wise, thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

act #1. Commencing at a stone monument on the north-easterly side of the Wild-Cat Road, so called, in the easterly line of land supposed to belong to Michael Arnold, thence North 50° 00' 45" East along land of said Arnold one hundred thirty-six and three tenths (136.3) feet to a stone monument at land supposed to belong to Michael Leahey, thence South 65° 53' East two hundred sixty-three and one tenth (263.1) feet to a stone monument, thence South 58° 17' 15" East one hundred eighty-one and three tenths (181.3) feet to a stone monument, thence North 63° 58' 30" East two hundred forty-seven and eight tenths (247.8) feet to a stone monument on the westerly side of the road from Granville to Westfield (The last three courses are along land supposed to belong to Michael Leahey), thence southerly along said road about three hundred twenty-five feet to the Wild-Cat Road, thence north-westerly along said Wild-Cat Road about six hundred seventy-feet to the place of beginning, containing about 2.55 acres.

act #2. Commencing at a stone monument on the easterly side of the road leading from Granville to Westfield and in the northerly line of land supposed to belong to A. J. Bruch, thence northerly along said road about seven hundred thirty-five feet to the middle of Hollister Brook, so called, thence south-easterly down the brook about nine hundred feet to land ~~land~~ supposed to belong to said Bruch, thence South 87° 37' West about fifteen feet to a stone monument, thence same course three hundred thirteen and two tenths (313.2) feet to the place of beginning, containing about 3.29 acres.

The two foregoing described tracts are supposed to belong to William J. Leahey of said Granville.

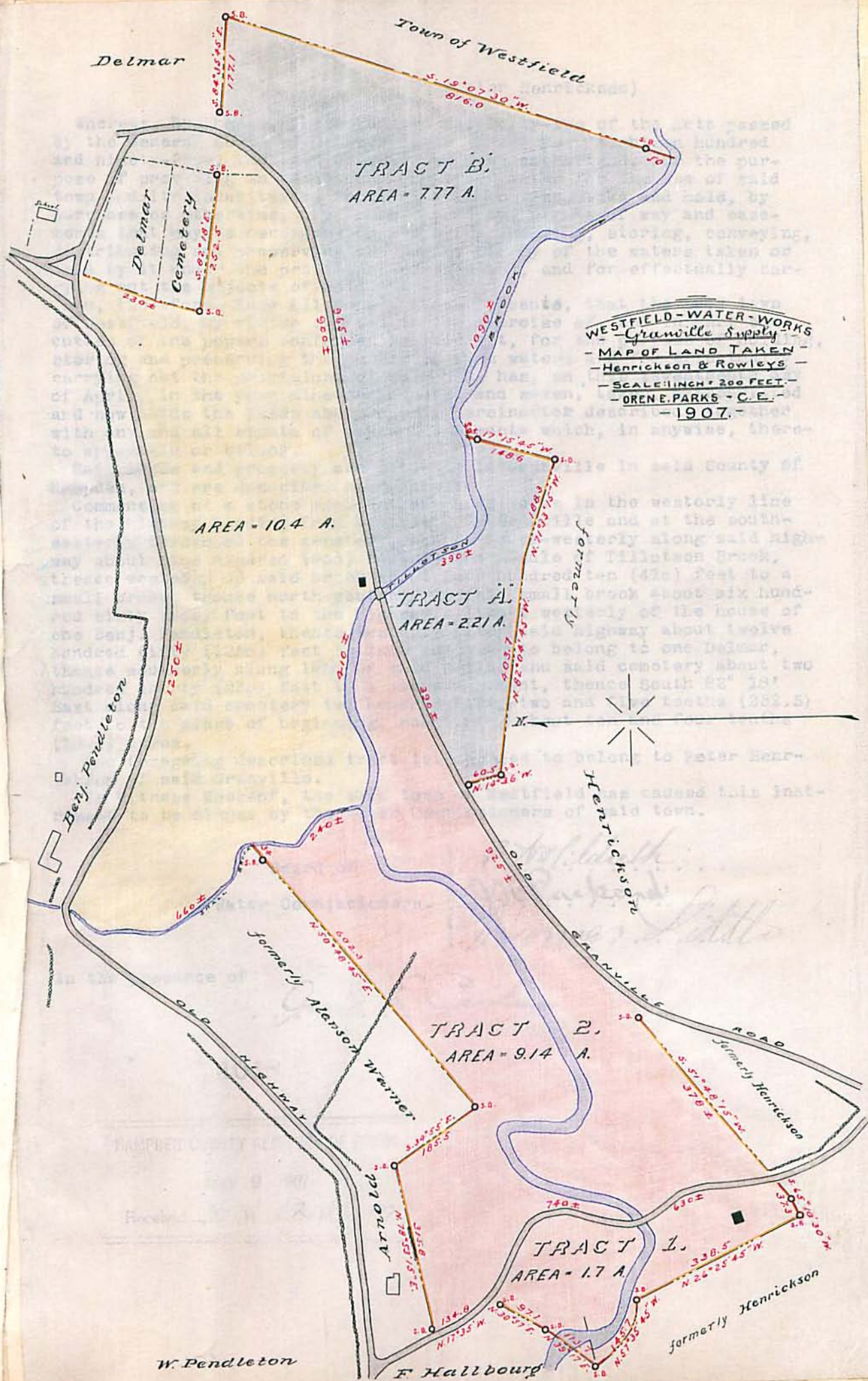
In Witness Whereof, the said Town has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners

S. W. Hildreth
Wm. Little
Job Packard

In the presence of

Oren E. Parks



(Peter Henrickson)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this seventeenth day of April, in the year nineteen hundred and seven, taken, appropriated and now holds the lands and property hereinafter described, together with any and all rights of way and easements which, in anywise, there-to appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument supposed to be in the westerly line of the highway leading from Westfield to Granville and at the southeasterly corner of the cemetery, thence south-westerly along said highway about nine hundred (900) feet to the middle of Tillotson Brook, thence westerly up said brook about four hundred ten (410) feet to a small brook, thence north-westerly up said small brook about six hundred sixty (660) feet to the highway a little westerly of the house of one Benj. Pendleton, thence easterly along said highway about twelve hundred fifty (1250) feet to land supposed to belong to one Delmar, thence southerly along land of said Delmar and said cemetery about two hundred thirty (230) feet to a stone monument, thence South 82° 18' East along said cemetery two hundred fifty-two and five tenths (252.5) feet to the place of beginning, containing about ten and four tenths (10.4) acres.

The foregoing described tract is supposed to belong to Peter Henrickson of said Granville.

In Witness Whereof, the said town of Westfield has caused this instrument to be signed by the Water Commissioners of said town.

Board of

Water Commissioners.

S. W. Wilderth
J. P. Packard
Thomas Little

In the presence of

John E. Parks

4048

HAMPDEN COUNTY REGISTRY OF DEEDS.

MAY 9 1907

Received *H. H.* 12 M. *P. M.*

(Fred E. Rowley)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this seventh day of May, in the year nineteen hundred and seven, taken, appropriated and now holds the lands and property hereinafter described, to gather with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract #1. Beginning at a stone monument supposed to be in the westerly line of the highway leading from the Old Granville Road to the old highway passing the house of Wilbur E. Pendleton at land formerly of one Henrickson, thence South $65^{\circ} 10' 30''$ West thirty-seven and three tenths (37.3) feet to a stone monument, thence North $26^{\circ} 25' 45''$ West three hundred thirty-eight and five tenths (338.5) feet to a stone monument about one rod southerly of Tillotson Brook, thence northwesterly parallel with said brook and one rod distant therefrom to a stone monument bearing North $57^{\circ} 35' 45''$ West about one hundred forty-five and seven tenths (145.7) feet from the last mentioned bound, thence North $39^{\circ} 17'$ East crossing said brook about one hundred thirteen and seven tenths (113.7) feet to a stone monument, the last four courses and south of the brook are along land formerly of Henrickson, thence North $30^{\circ} 57'$ East ninety-seven and one tenth (97.1) feet to a stone monument supposed to be in the westerly line of the highway, the last course and to the brook is along land supposed to belong to Frank Hall bourg, thence southerly along the highway about six hundred thirty (630) feet to the place of beginning, containing about one and seven tenths (1.7) acres.

Tract #2. Beginning at a stone monument supposed to be in the easterly line of the highway bearing North $17^{\circ} 35'$ West about one hundred thirty-four and eight tenths (134.8) feet from the northerly monument mentioned in the description of tract #1, thence North $78^{\circ} 53' 15''$ East about three hundred fifteen and eight tenths (315.8) feet to a stone monument, thence South $34^{\circ} 55'$ East about one hundred eighty-five and five tenths (185.5) feet to a stone monument, thence North $50^{\circ} 48' 45''$ East about six hundred two and three tenths (602.3) feet to a stone monument, thence same course about thirty-four feet to the middle of a small brook, the last three courses are along land of one Arnold, formerly of Alanson Warner, thence southerly down the brook to its junction with the Tillotson Brook, thence easterly down said Tillotson Brook to the Old Granville Road, thence south-westerly along said road about nine hundred twenty-five (925) feet to a stone monument at land formerly of one Henrickson, thence South $51^{\circ} 48' 15''$ West along land formerly of said Henrickson about three hundred seventy-eight (378) feet to the highway, thence north-westerly along said highway about seven hundred forty (740) feet to the place of beginning, containing about nine and fourteen one-hundredths (9.14) acres.

The two foregoing described tracts are supposed to belong to Fred E.

(2)

(Fred E. Rowley)

Rowley of said Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners

S. Hildreth
W. B. Packard
Wm. W. Little

In the presence of

Orin E. Parks

4049

HAMPDEN COUNTY REGISTRY OF DEEDS.

MAY 9 1907

Received 4 H. 12 M. P.M.

(Christiana Rowley)

reas, by Chapter three hundred and forty-two of the Acts passed
he General Court of Massachusetts in the year eighteen hundred
ninety-five, the town of Westfield was authorized, for the pur-
of providing an additional supply of water for the use of said
and its inhabitants, to, from time to time, take and hold, by
hase or otherwise, any lands, property, rights of way and ease-
s that may be necessary or proper for holding, storing, conveying,
ributing and preserving the purity of any of the waters taken or
by it under the provisions of said Act, and for effectually car-
g out the objects of said Act:-

, therefore, Know All Men By These Presents, that the said town
estfield, by virtue of, and in the exercise of, and in part exe-
on of the powers conferred by said act, for the purpose of holding,
ing and preserving the purity of such waters and for effectually
ying out the provisions of said act, has, on this seventh day of
in the year nineteen hundred and seven, taken, appropriated and
holds the lands and property hereinafter described, together with
and all rights of way and easements which, in anywise, thereto
tain or belong.

id lands and property are situated in Granville in said County of
len, and are described as follows:-

ct "A". Beginning at a stone monument supposed to be in the easterly
of the Old Granville Road, thence north-easterly along said road
three hundred ninety (390) feet to the middle of Tillotson Brook,
e easterly down said brook about three hundred ninety (390) feet
and formerly of Peter Henrickson, thence South $17^{\circ} 15' 45''$ West
twenty (20) feet to a stone monument, thence same course about
hundred forty-eight and six tenths (148.6) feet to a stone monu-
thence North $71^{\circ} 33' 15''$ West about one hundred eighty-eight and
^ (188.3) feet, thence North $82^{\circ} 04' 45''$ West about four hundred
and seven tenths (403.7) feet to a stone monument, thence North
6' West about sixty and five tenths (60.5) feet to the place of
ning, containing about two and twenty-one one-hundredths (2.21)

. The last four courses are along land formerly of Peter Henrick-
A right of way over the road passing through this tract to land
rly owned by Henrickson is hereby reserved to the present owner.

t "B". Beginning at a point in the easterly line of the Old Gran-
Road at the Middle of Tillotson Brook, thence north-easterly
said road about nine hundred sixty-five (965) feet to a stone
ent at land of one Delmar, thence South $84^{\circ} 35' 45''$ East along
of said Delmar about one hundred seventyseven and one tenth (177.1)
to a stone monument at land of the town of Westfield formerly of
Plumley, thence South $19^{\circ} 07' 30''$ West along said land about
hundred sixteen (816.0) feet to a stone monument, thence same
e about fifty (50.) feet to the middle of Tillotson Brook, thence
ly up the brook about ten hundred ninety (1090) feet to the place
inning, containing about seven and seventy-seven one-hundredths
acres.

e two foregoing described tracts are supposed to belong to
Christiana Rowley of said Granville.

Witness Whereof, the said Town of Westfield has caused this
ament to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners.

L. W. Hildreth
J. B. Packard
Thomas Little

presence of

Oran E. Parks

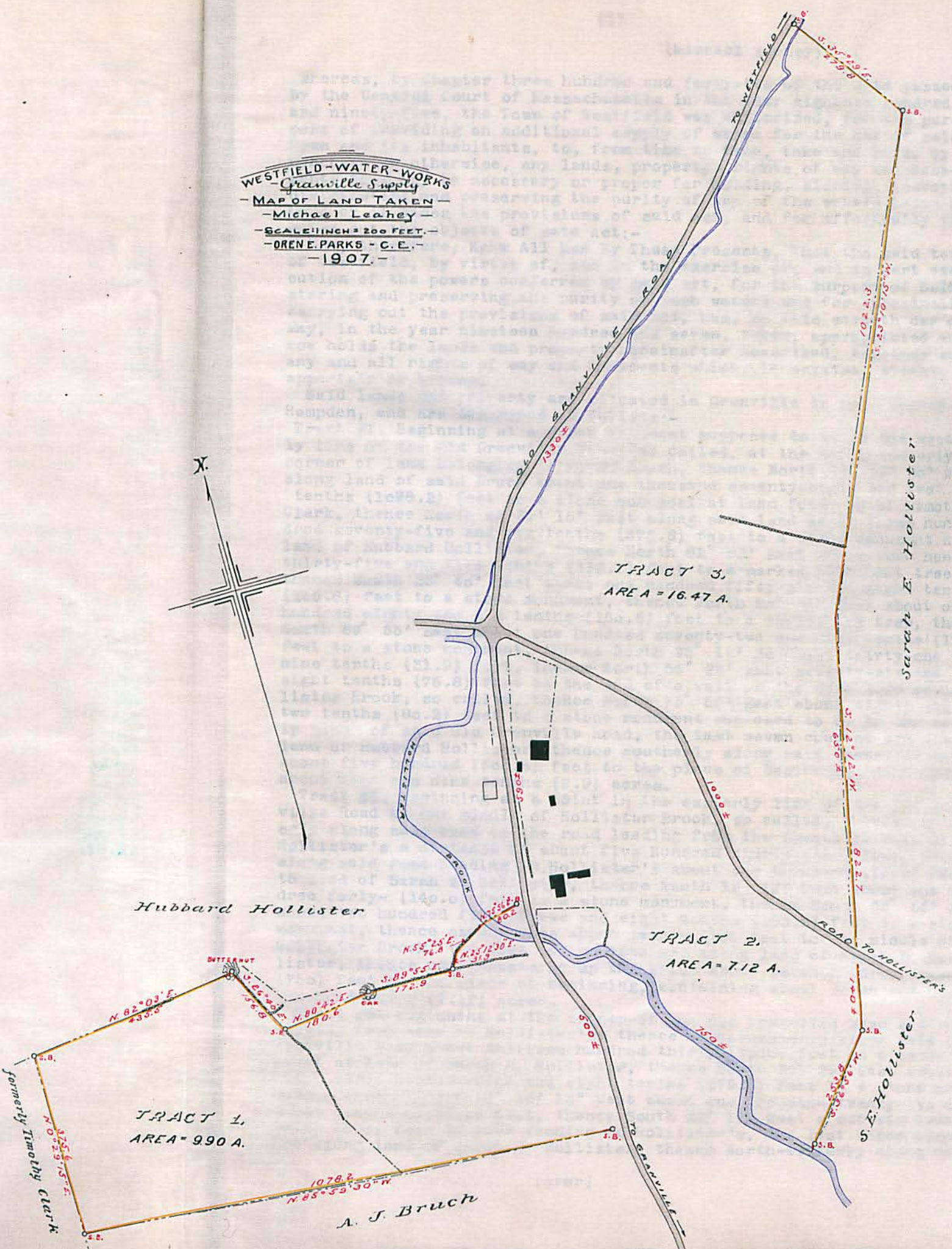
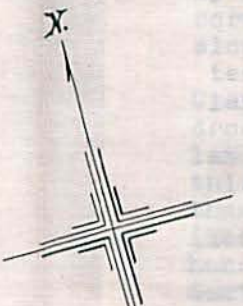
HAMPDEN COUNTY REGISTRY OF DEEDS.

4050

MAY 9 1907

Received *4* H. *12* M. *P.M.*

WESTFIELD-WATER-WORKS
 Granville Supply
 -MAP OF LAND TAKEN-
 -Michael Leakey
 -SCALE 1 INCH = 200 FEET.-
 -ORENE PARKS - C.E.-
 -1907.-



(Michael Leahey)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this seventh day of May, in the year nineteen hundred and seven, taken, appropriated and now holds the lands and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong,

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract #1. Beginning at a stone monument supposed to be in the westerly line of the Old Granville Road, so called, at the north-easterly corner of land belonging to A. J. Bruch, thence North $85^{\circ} 59' 30''$ West along land of said Bruch about one thousand seventy-eight and two tenths (1078.2) feet to a stone monument at land formerly of Timothy Clark, thence North $00^{\circ} 29' 15''$ East along said land about three hundred seventy-five and six tenths (375.6) feet to a stone monument at land of Hubbard Hollister, thence North $82^{\circ} 03'$ East about four hundred thirty-five and five tenths (435.5) feet to a marked butternut tree, thence South $26^{\circ} 40'$ East about one hundred fifty-six and eight tenths (156.8) feet to a stone monument, thence North $80^{\circ} 42'$ East about one hundred eighty and six tenths (180.6) feet to a marked oak tree, thence South $89^{\circ} 55'$ East about one hundred seventy-two and nine tenths (172.9) feet to a stone monument, thence North $25^{\circ} 12' 30''$ East thirty-one and nine tenths (31.9) feet, thence North $55^{\circ} 25'$ East seventy-six and eight tenths (76.8) feet to the end of a wall on the west side of Hollister Brook, so called, thence North $75^{\circ} 56'$ East about eighty and two tenths (80.2) feet to a stone monument supposed to be in the westerly line of said Old Granville Road, the last seven courses are along land of Hubbard Hollister, thence southerly along said Granville Road about five hundred (500.0) feet to the place of beginning, containing about nine and nine tenths (9.9) acres.

Tract #2. Beginning at a point in the easterly line of the Old Granville Road at the middle of Hollister Brook, so called, thence north-erly along said road to the road leading from the Granville road to Hollister's a distance of about five hundred ninety (590) feet, thence along said road leading to Hollister's about one thousand (1000) feet to land of Sarah E. Hollister, thence South $12^{\circ} 12'$ West about one hundred forty- (140.0) feet to a stone monument, thence South $36^{\circ} 56'$ West about two hundred fifty-three and eight tenths (253.8) feet to a stone monument, thence same course about twenty (20) feet to the middle of Hollister Brook, the last two courses are along land of Sarah E. Hollister, thence north-westerly up the brook about seven hundred fifty (750) feet to the place of beginning, containing about seven and twelve one-hundredths (7.12) acres.

Tract #3. Beginning at the corner of the Old Granville Road and road leading from same to Hollister's, thence North-easterly along said Old Granville Road about thirteen hundred thirty (1330) feet to a stone monument at land of Sarah E. Hollister, thence South $35^{\circ} 29'$ East about two hundred seventy-nine and eight tenths (279.8) feet to a stone monument, thence South $23^{\circ} 10' 15''$ West about one thousand twenty-two and three tenths (1022.3) feet, thence South $12^{\circ} 12'$ West about six hundred fifty (650) feet to road leading to Hollister's, the last three courses are along land of Sarah E. Hollister, thence North-westerly along said

(Michael Leahey)

road about one thousand (1000) feet to the place of beginning, containing about sixteen and forty-seven one-hundredths (16.47) acres. The three foregoing described tracts are supposed to belong to Michael Leahey of said Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

L. W. Hilduth
W. B. Packard
D. W. Little

In the presence of

Geo. E. Parks

4031

HAMPDEN COUNTY REGISTRY OF DEEDS.

MAY 9 1907

Received 4 H. 12 M. P. M.

(Benjamin E. Pendleton)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefor, Know All Men By These Presents, that the said town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this eighth day of November, in the year nineteen hundred and seven, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument supposed to be in the northerly line of the highway about one hundred thirty-five (135) feet westerly of a small brook and at the northeasterly corner of land of Wilbur E. Pendleton, thence North $84^{\circ}47'30''$ West about eleven hundred forty-three and three tenths (1143.3) feet to a stone monument, thence North $6^{\circ}25'30''$ East about eight hundred sixty and three tenths (860.3) feet, thence North $4^{\circ}28'45''$ East about three hundred eighty-eight and five tenths (388.5) feet, thence North $8^{\circ}32'$ East about two hundred eighty-six and six tenths (286.6) feet, thence North $4^{\circ}59'15''$ East about eight hundred twenty-four and three tenths (824.3) feet to a stone monument, the foregoing described courses are along land of Wilbur E. Pendleton, thence North $89^{\circ}53'15''$ East about two hundred fifty-one and eight tenths (251.8) feet, thence South $76^{\circ}47'45''$ East about two hundred fifty-five and four tenths (255.4) feet, thence North $85^{\circ}46'$ East about one hundred thirty and five tenths (130.5) feet, thence South $72^{\circ}01'45''$ East about one hundred forty-three and six tenths (143.6) feet, thence South $56^{\circ}33'45''$ East about ninety-nine and one tenth (99.1) feet, thence South $74^{\circ}08'$ East about one hundred seventy-nine and five tenths (179.5) feet, thence South $81^{\circ}05'$ East about two hundred nine and five tenths (209.5) feet to a stone monument, thence South $29^{\circ}58'$ East about one hundred seventy-two and three tenths (172.3) feet, thence South $43^{\circ}38'30''$ East about two hundred thirty-three and two tenths (233.2) feet, thence South $50^{\circ}00'30''$ East about two hundred eighty-three and seven tenths (283.7) feet to a stone monument, thence South $5^{\circ}21'30''$ West about two hundred twenty-two and eight tenths (222.8) feet to a stone monument, thence South $27^{\circ}28'$ West about one thousand twenty-three and nine tenths (1023.9) feet to land of Christiana Rowley, the last twelve courses are along land of Martin Peterson, thence same course about one hundred forty (140) feet, thence South $59^{\circ}42'45''$ East twelve (12) feet to a stone monument, thence same course about five hundred twenty-nine and seven tenths (529.7) feet to a stone monument, thence South $12^{\circ}51'15''$ West about four hundred four and eight tenths (404.8) feet to a stone monument supposed to be in the northerly line of the highway, the last three courses are along land of Christiana Rowley, thence westerly along the highway about six hundred sixty (660) feet to the place of beginning; containing about eighty-four and sixty-two one-hundredths (84.62 A.) acres.

The foregoing described tract is supposed to belong to Benjamin E. Pendleton of said Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

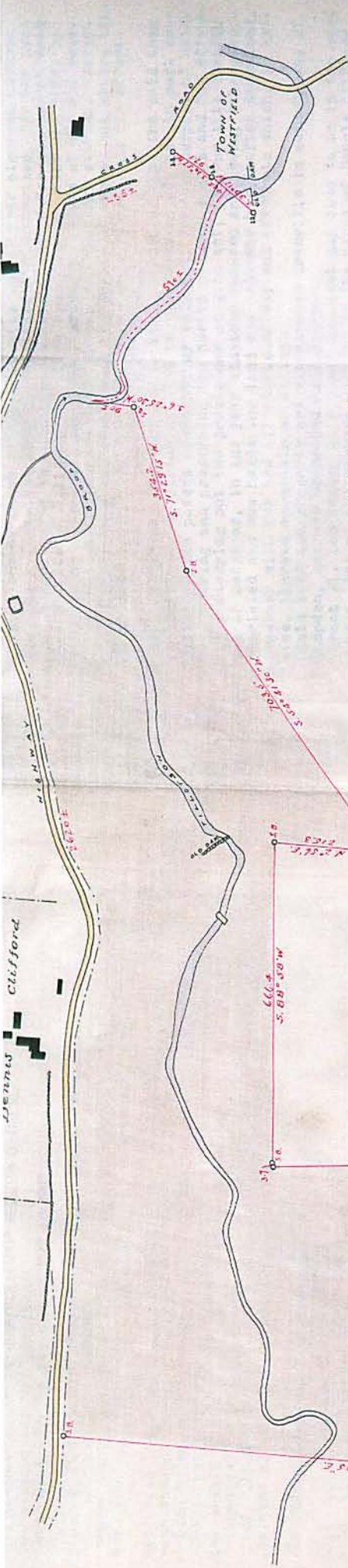
Board of
Water Commissioners.

S. H. Little
W. H. Little

In the presence of *H. H. Sanderson*

Jennies Clifford

Highway



Marius Jensen

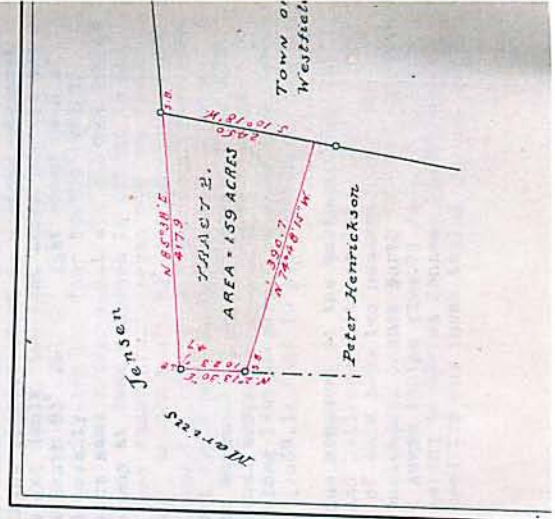
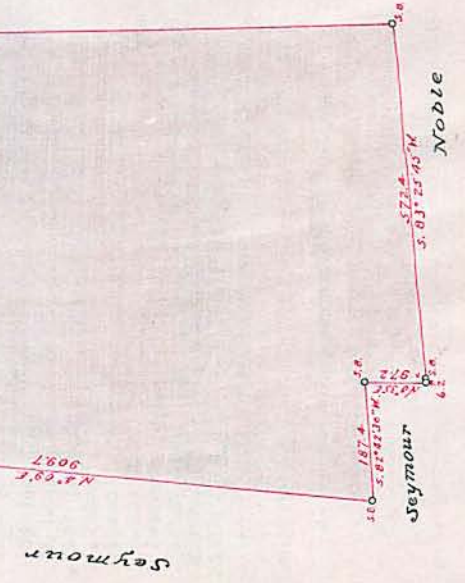
Dustin Tice

TJAC 2.
AREA = 488 ACRES

Jackelt



WESTFIELD - WATER WORKS
- CHANVILLE DITCH
- MAP OF LAND TAKEN
- FRANK HOLLIBOURG
- SCALE 1 INCH = 200 FEET
- ORENE PARKS - C.E.
- 1907.



Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know ALL Men By These Presents, that the said town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this twelfth day of December, in the year nineteen hundred and seven, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract #1. Commencing at a stone monument supposed to be in the southerly line of the highway leading by the house of Dennis Clifford, thence easterly along the southerly line of said highway about twenty-six hundred twenty (2620) feet to the cross road leading from a point opposite house of Wilbur Pendleton southeasterly to the main highway leading to Granville Corners, thence southeasterly along said cross road about two hundred fifty-five (255) feet to a stone monument at land of said Westfield, thence South $30^{\circ} 57'$ West about ninety-seven and one tenth (97.1) feet to a stone monument, thence South $39^{\circ} 17'$ West about forty (40) feet to the middle of Tillotson Brook, so called, the last two courses are along land of said town, thence northwesterly up said brook about five hundred seventy (570) feet, thence South $6^{\circ} 25' 30''$ West about ninety (90) feet to a stone monument, thence South $71^{\circ} 29' 15''$ West about three hundred fifty-four and two tenths (354.2) feet to a stone monument, thence South $54^{\circ} 41' 30''$ West about seven hundred three and five tenths (703.5) feet to a stone monument at land supposed to belong to one Sackett, the last four courses are along land supposed to belong to Marius Jensen, thence North $2^{\circ} 56'$ East about two hundred fifteen and three tenths (215.3) feet to a stone monument, thence South $88^{\circ} 58'$ West about six hundred sixty-six and four tenths (666.4) feet to a stone monument, thence same course about three and seven tenths (3.7) feet to a white-birch stump, thence South $2^{\circ} 28' 45''$ East about fifteen hundred sixty-five and two tenths (1565.2) feet to a stone monument at land supposed to belong to one Noble, the last three courses are along land of Sackett, thence South $83^{\circ} 25' 45''$ West along land of said Noble about five hundred seventy-two and four tenths (572.4) feet to a stone monument, thence same course about six and two tenths (6.2) feet to a white-birch stump at land supposed to belong to one Seymour, thence North $0^{\circ} 35'$ East about ninety-seven and two tenths (97.2) feet to a stone monument, thence South $82^{\circ} 42' 30''$ West about one hundred eighty-seven and four tenths (187.4) feet to a stone monument, thence North $4^{\circ} 09'$ East about nine hundred nine and seven tenths (909.7) feet to a stone monument at land of Dustin Tice, the last three courses are along land supposed to belong to Seymour, thence North $3^{\circ} 14' 45''$ East along land of said Tice about ten hundred sixty-eight and one tenth (1068.1) feet to place of beginning, containing about 48.80 acres.

Tract #2. Commencing at a stone monument at the northwesterly corner of land taken of Plumley and Hallbourg October 1st., 1901, thence South $10^{\circ} 18'$ West along land of said town two hundred forty-five (245) feet to land of Peter Henrickson, thence North $74^{\circ} 48' 15''$ West about three hundred ninety and seven tenths (390.7) feet to a stone monument at land supposed to belong to Marius Jensen, thence North $2^{\circ} 13' 30''$ East about one hundred two and three tenths (102.3) feet

(Frank Hallbourg, Dec. 12, 1907)

to a stone monument, thence same course four and seven tenths (4.7) feet to a chestnut stump, thence North 85° 38' East about four hundred seventeen and nine tenths (417.9) feet to place of beginning, the last two courses are along land supposed to belong to Marius Jensen, containing about 1.59 acres.

The two foregoing described tracts are supposed to belong to Frank Hallbourg of said Westfield.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

L. W. Little
Thomas Little

In the presence of

H. W. Sanderson

11580

HAMPDEN COUNTY REGISTRY OF DEEDS.

DEC 30 1907

Received 2 H. 15 M. P.M.

(Harriet M. Frost)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this second day of March, in the year nineteen hundred and eight, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument on the westerly side of the Wild-cat road and at the northeasterly corner of land of the Heirs of R. S. Brown thence North $84^{\circ}11'30''$ West along land of said Heirs about eleven hundred five and six tenths (1105.6) feet to a stone monument at land of Hubbard Hollister, thence North $88^{\circ}43'30''$ West along land of said Hollister about six hundred fifty-eight and seven tenths (658.7) feet to a stone monument at land of Michael Arnold, thence North $4^{\circ}59'$ East about five hundred twenty-two (522) feet, thence South $87^{\circ}42'$ East about thirteen hundred two (1302) feet to a stone monument at land of one Fowler, the last two courses are along land of said Arnold, thence same course along land of said Fowler about two hundred twenty (220) feet to a stone monument on the westerly side of said Wild-cat road, thence southerly along said road about six hundred five (605) feet to the place of beginning, containing about 19.64 acres.

The foregoing described tract is supposed to belong to Harriet M. Frost of said Westfield.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

L. H. Hildreth
Wm. Little

In the presence of

Ann E. Parks

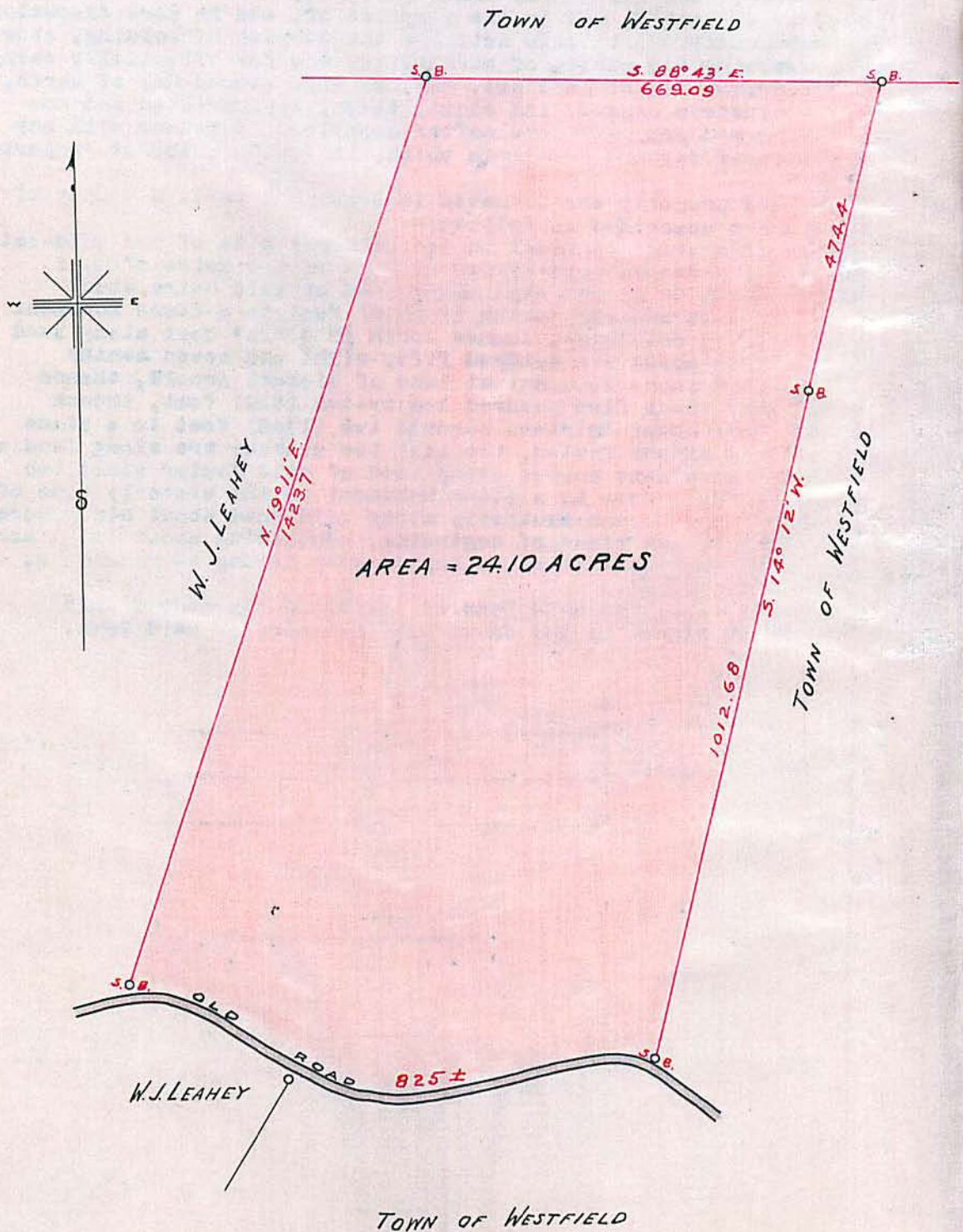
2946

HAMPDEN COUNTY REGISTRY OF DEEDS.

APR 21 1908

Received 9 H. 05 M. a.m.

WESTFIELD-WATER-WORKS
Grawville Supply
- MAP OF LAND TAKEN -
- Michael Arnold -
- SCALE: 1 INCH = 200 FEET -
- OREN E. PARKS - C. E. -
- 1908 -



(Michael E. Arnold)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefor, Know All Men By These Presents, that the said town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said act, has, on this second day of March, in the year nineteen hundred and eight, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract #1. Known as the Wells Mill lot; Commencing at a stone monument on the easterly side of the Wild-cat road, so called, at the corner of land of said Inhabitants, formerly of Wm. J. Leahey, thence South 46° 32' West, crossing said road and the brook, one hundred two and five tenths (102.5) feet to a stone monument, thence North 54° 15' 30" West two hundred ninety-six (296) feet to a stone monument, the last two courses are along land supposed to belong to Hubbard Hollister thence North 3° 20' 30" West two hundred eighty-seven and one tenth (287.1) feet to a stone monument, thence South 81° 36' East crossing said Wild-cat road two hundred forty-nine and six tenths (249.6) feet to a stone monument, the last two courses and westerly of said road are along land supposed to belong to the Heirs of R. S. Brown, thence North 87° 22' 30" East one hundred three and seven tenths (103.7) feet to a stone monument, thence South 44° 11' East two hundred ninety-five and nine tenths (295.9) feet to a stone monument, thence South 23° 07' West one hundred and three tenths (100.3) feet to a stone monument at land of Inhabitants of Town of Westfield, the last three courses are along land supposed to belong to one Loomis, thence North 65° 53' West along land of said Inhabitants eighty-nine and eight tenths (89.8) feet to a stone monument, thence South 50° 00' 45" West one hundred thirty-six and three tenths (136.3) feet to the place of beginning; containing about three and twenty-three one-hundredths (3.23) acres.

Tract #2. Commencing at a stone monument in the northerly line of land formerly of Harriet Frost and distant westerly about two hundred twenty (220) feet from the Wild-cat road, thence North 87° 42' West about thirteen hundred two (1302) feet, thence South 4° 59' West about five hundred twenty-two (522) feet to a stone monument at land of Hubbard Hollister, the last two courses are along land formerly of Harriet Frost, thence same course along land of Hubbard Hollister five hundred five and six tenths (505.6) feet to a stone monument at land supposed to belong to Wilbur Pendleton, thence North 86° 38' 30" West along land of said Pendleton three hundred fifty-three and three tenths (353.3) feet to a stone monument at land supposed to belong to Jerry Sullivan, thence North 7° 44' 15" West along land of said Sullivan about one thousand forty-eight and one tenth (1048.1) feet to a stone monument at land of Town of Westfield, thence South 87° 42' East two hundred thirty-six and four tenths (236.4) feet to a stone monument, thence north 7° 13' 45" East six hundred ninety-seven and seven tenths (697.7) feet to a stone monument at land of one Blanchard, the last two courses are along land of Town of Westfield, thence South 89° 09' 45" East one thousand seventy-seven and six tenths (1077.6) feet to a stone monument below Reed's Mill Dam, so called, thence North 85° 46' 45" East crossing the Wild-cat road, six hundred seventeen (617.0) feet to a stone monument at land supposed to belong to one Fowler, the last two courses are along land supposed to belong to one Blanchard and known as Reed place, thence South 9° 35' 45" West along land of one Fowler and recrossing said road, eight hundred twenty-six and nine tenths (826.9) feet to place of beginning; containing 39.09 acres.

(Michael E. Arnold)

Tract #3. Commencing at a stone monument on the northerly side of the old road from the Carlton Strong place to Henry Winchell place and at the southwesterly corner of land of the Town of Westfield, formerly of James Andrews, thence westerly along said road about eight hundred twenty-five (825) feet to a stone monument at land of W. J. Leahey, thence North $19^{\circ}11'$ East along land of said Leahey fourteen hundred twenty-three and seven tenths (1423.7) feet to a stone monument at land of Town of Westfield, formerly of Plumley & Hallbourg, thence South $88^{\circ}43'$ East about six hundred sixty-nine and nine one-hundredths (669.09) feet to a stone monument, thence South $14^{\circ}12'$ West four hundred seventy-four and four tenths (474.4) feet to a stone monument, thence same course about one thousand twelve and sixty-eight one-hundredths (1012.68) feet to place of beginning; containing twenty-four and one tenth (24.1) acres.

The foregoing described tracts are supposed to belong to Michael E. Arnold of said Granville.

In witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

S. W. Hildreth
Wm Little
S. A. Allen

In the presence of

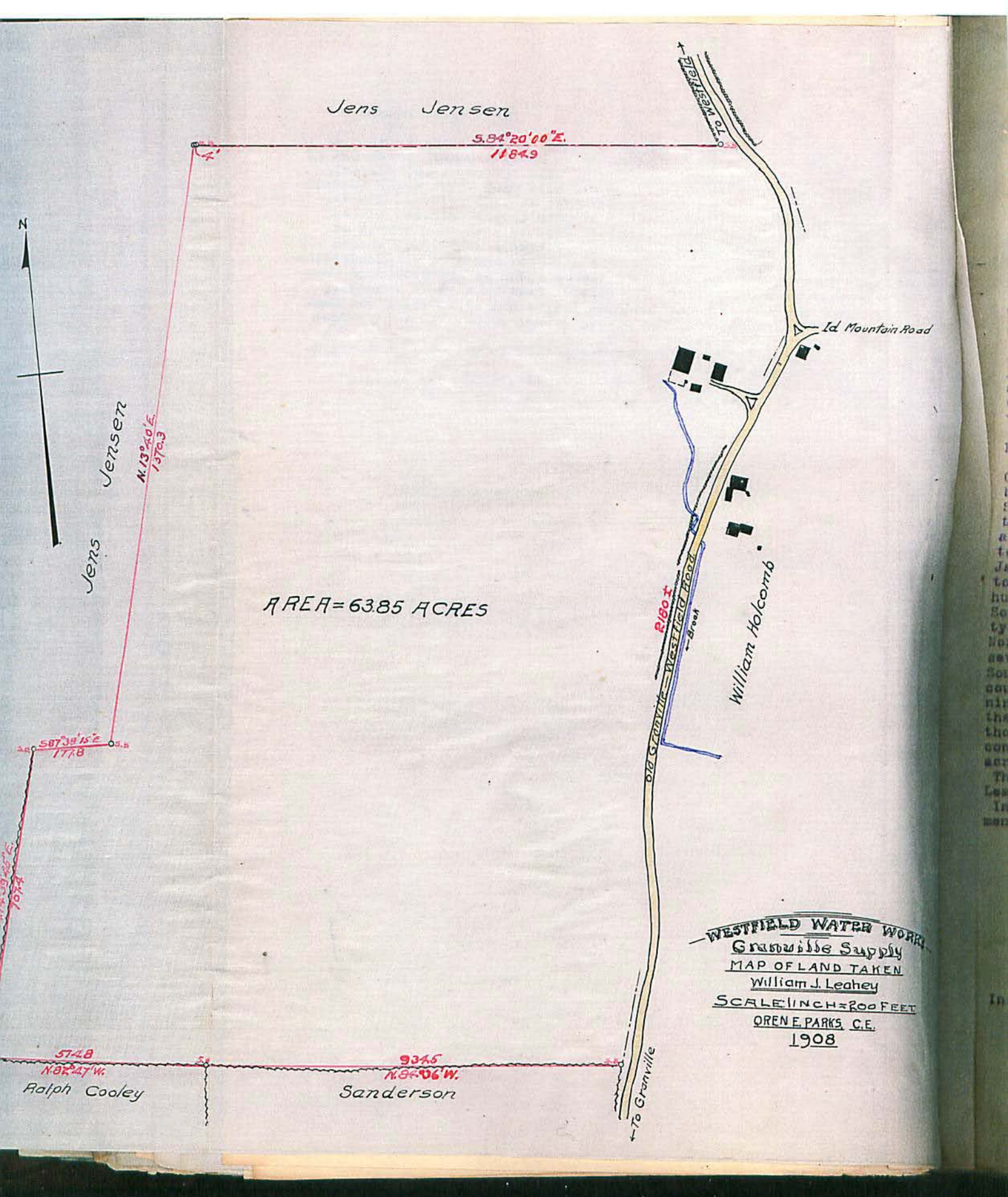
Quin E. Parks

2945

HAMPDEN COUNTY REGISTRY OF DEEDS.

APR 21 1908

Received 9 H. 05 M. A.M.



(William J. Leahey)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this first day of August, in the year nineteen hundred and eight, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument on the westerly side of the old Granville road and at the northeasterly corner of land supposed to belong to one Sanderson, thence North 84°36' West along land of said Sanderson about nine hundred thirty-four and five tenths (934.5) feet to a stone monument at land of Ralph Cooley, thence North 82°47' West along land supposed to belong to said Cooley about five hundred fourteen and eight tenths (514.8) feet to a stone monument at land of Jas. Gibbons Estate, thence North 14°39'45" East along land supposed to belong to said Gibbons Estate and land of Jens Jensen about seven hundred seven and four tenths (707.4) feet to a stone monument, thence South 87°38'15" East along land of said Jensen about one hundred seventy seven and eight tenths (177.8) feet to a stone monument, thence North 13°40' East along land of said Jensen about thirteen hundred seventy and three tenths (1370.3) feet to a chestnut stump, thence South 84°20' East four (4) feet to a stone monument, thence same course along land of said Jensen about eleven hundred eighty-four and nine tenths (1184.9) feet to a stone monument on the westerly side of the old Granville road, thence southerly along said road about two thousand one hundred and eighty (2180) feet to the place of beginning; containing about sixty-three and eighty-five one-hundredths (63.85) acres.

The foregoing described tract is supposed to belong to William J. Leahey of said Granville.

In witness whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners.

A. M. Hildreth.
S. J. Allen
Thos Little

In the presence of

Chas M Root

7108

HAMPDEN COUNTY REGISTRY OF DEEDS.

AUG 26 1888

Received 10 H 30 M A M

A simple diagram consisting of a vertical line and a horizontal line intersecting at a point. The top of the vertical line is labeled with the letter 'N'.

$\frac{1}{2} \times 1.8843 \times 10^4 \times 967.20 = 9.18 \times 10^6 \text{ J}$

Peter Henrikson

*N. 19° 11' E.
1423.7*

TRACT B.

5.3059
195.6

S. 82° 11' W.
138.4

Town of Westfield

To Winchells →

(William J. Leahey)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefor, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this first day of August, in the year nineteen hundred and eight, taken, appropriated and now holds the lands and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract "A". Commencing at a stone monument on the northerly side of the Id Mountain road (so called) and at the southwesterly corner of land of the Town of Westfield, thence westerly along said road about six hundred thirty (630) feet to a stone monument at land of Peter Henrickson, thence North $6^{\circ}24'$ West along land of said Henrickson about four hundred fifty-five and five tenths (455.5) feet to a stone monument, thence North $6^{\circ}47'$ East along land of said Henrickson about eleven hundred sixty-three and two tenths (1163.2) feet to a stone monument at land of Town of Westfield, thence South $88^{\circ}43'$ East along land of said Town about nine hundred fifty-one and two tenths (951.2) feet to a stone monument, thence South $19^{\circ}11'$ West along land of said Town about fourteen hundred twenty-three and seven tenths (1423.7) feet to the place of beginning; containing about twenty-six and one tenth (26.1) acres.

Tract "B". Commencing at a stone monument on the southerly side of the Id Mountain road at the northwesterly corner of land of the Town of Westfield, thence South $30^{\circ}59'$ West about one hundred ninety-five and five tenths (195.5) feet to a stone monument, thence South $82^{\circ}11'$ West about one hundred thirty-eight and four tenths (138.4) feet to a stone monument, the last two courses are along land of said Town, thence North $13^{\circ}36'$ West along land of William Holcomb about two hundred seventy-four and eight tenths (274.8) feet to a stone monument on the southerly side of said road, thence easterly along said road about three hundred forty-two (342) feet to the place of beginning; containing about one and three tenths (1.3) acres.

The foregoing described tracts are supposed to belong to William J. Leahey of said Granville.

In witness whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners.

L. W. Hildreth
L. J. Allen
John Little

In the presence of

W. M. Root

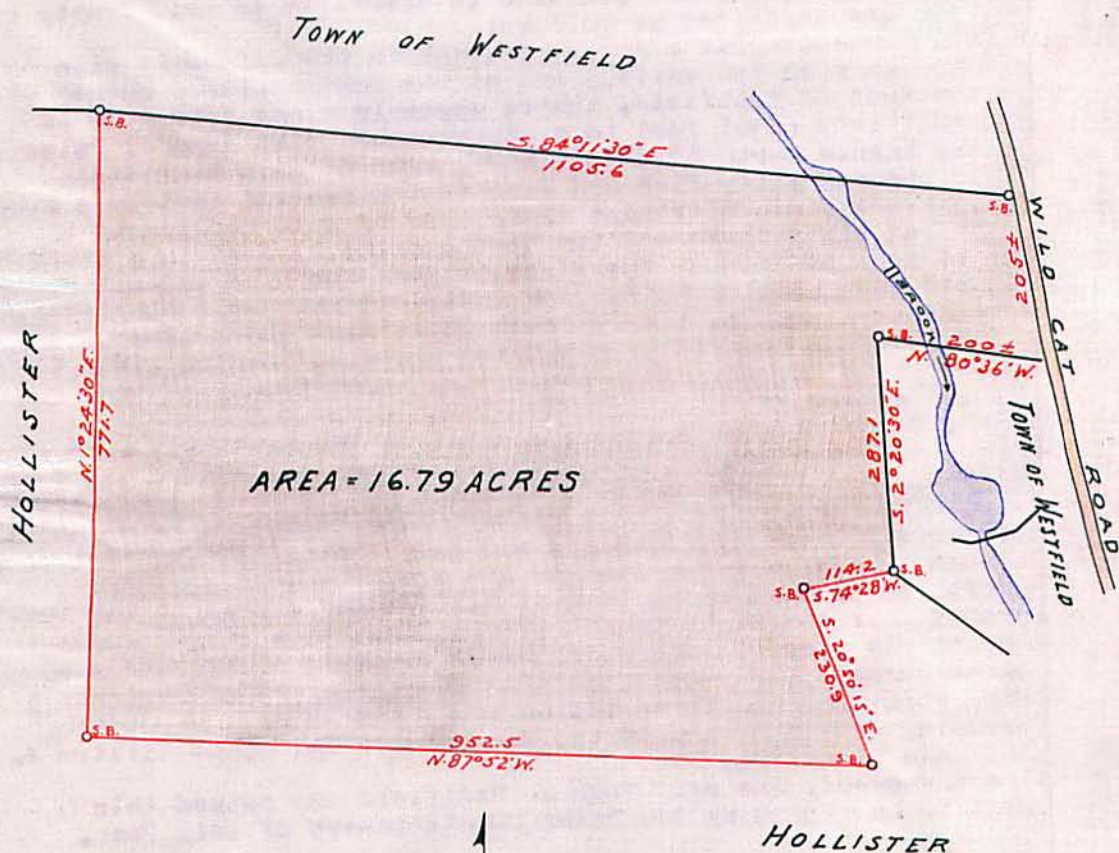
7102

HAMPDEN COUNTY REGISTRY OF DEEDS.

AUG 26 1908

Received 10 H. 30 M. a.m.

WESTFIELD-WATER-WORKS
Graunville Supply
 - MAP OF LAND TAKEN -
 - LUCY M. BROWN, et al. -
 - SCALE: 1 INCH = 200 FEET. -
 - OREN E. PARKS - C. E. -
 - 1908. -



(Lucy M. Brown, et. als.)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefor, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this first day of July, in the year nineteen hundred and eight, taken, appropriated and now holds the land and property hereinafter described together with any and all rights of way and easements which, in anywise there-to appertain or belong.

Said land and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument on the westerly side of the Wild-cat road (so called) at the southeasterly corner of land of the Town of Westfield taken of Harriet M. Frost, thence southerly along said highway about two hundred five (205) feet to land of said Town, taken of Michael E. Arnold and Know as the Wells Mill Lot, thence North $80^{\circ}36'$ West about two hundred (200) feet to a stone monument, thence South $2^{\circ}20'30''$ East two hundred eighty-seven and one tenth (287.1) feet to a stone monument, the last two courses are along land of said Town, thence South $74^{\circ}28'$ West about one hundred fourteen and two tenths (114.2) feet to a stone monument, thence South $20^{\circ}50'15''$ East about two hundred thirty and nine tenths (230.9) feet to a stone monument, thence North $87^{\circ}52'$ West about nine hundred fifty-two and five tenths (952.5) feet to a stone monument, thence North $1^{\circ}24'30''$ East about seven hundred seventy-one and seven tenths (771.7) feet to a stone monument at land of said Town, the last four courses are along land of Hubbard Hollister, thence South $84^{\circ}11'30''$ East along land of said Town about eleven hundred five and six tenths (1105.6) feet to the place of beginning, containing about sixteen and seventy-nine one-hundredths (16.79) acres.

The foregoing described tract is supposed to belong to Lucy M. Brown and others of said Granville.

In witness whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

S. W. Aldrich
Wm. Little
S. J. Allen

In the presence of

J. H. Sanderson

8554

HAMPDEN COUNTY REGISTRY OF DEEDS.

OCT 8 1908

Received 9 11 50 A.M.

Westfield Water Works - Granville Supply - Description of land Taken & Location Maps - 1908



1908 Reports

"Westfield Water Works - Granville Supply - Description of Lands Taken & Location Maps 1908".
Filed Hampden County Registry of Deeds November 16, 1908, James R. Wells, Register. Chapter 342
Acts 1895.

City/Town	Granville
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City/Town	Westfield
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Name	Peck, L O
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Name	Sullivan, Jerry
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Name	Sullivan, Katie A
------	-------------------

Name	Peck, A E
------	-----------

Name	Fowler, Joseph J
------	------------------

Name	Allen, Flavia J
------	-----------------

Name	Winchell, Artemese
------	--------------------

Name	Jones, Wilbur S
------	-----------------

Name	Holcomb, Elizabeth A
------	----------------------

Name	Holcomb, William O
------	--------------------

Name	Consolatti, Stephen
------	---------------------

Name	Carew, Justin G
------	-----------------

Name	Kellogg, Eliza E
------	------------------

Name	Tice, Dustin A
------	----------------

Name	Sauers, Rosa M
------	----------------

Name	Bruch, A J
------	------------

Name	Roach, David L
Name	Phelan, Mary J
Name	Pendelton, Wilbur
Name	Hollister, Sarah E
Name	Clifford, Dennis
Name	Hollister, Hubbard
Name	McDonald, Nellie Shoughrue
Name	Noble, Andelusia
Railroads	New York New Haven & Hartford Railroad Company
Railroads	Holyoke & Westfield Railroad
Streets	Granville Road
Streets	Northampton Road
Streets	Mountain Road
Streets	Old Granville Road
Streets	West Granville Road
Streets	Phelon Road
Streets	Wild Cat Road
Water	Munn's Brook
Water	Tillotson Brook
Water	Japhet Brook
Water	Hollister Brook
Water	Hollister Brook

Dam Legislation Letter 1956 Worcester County Commissioners



1956 Reports

Letter dated June 29, 1956 from Francis B. Cassidy, Secretary & Treasurer of the County Commissioners' & Sheriff's Association in opposing the take over of dams by the Commonwealth of Massachusetts.

Dam	Hampden County
Name	Massachusetts Comm
Name	County Commissioners' & Sheriff's Association

WESTFIELD WATER WORKS
GRANVILLE SUPPLY
DESCRIPTION OF LANDS TAKEN
AND LOCATION MAPS

1908

J. Shoughroe

David Roach

Eugene Sullivan

Dexter Phelan

Jerry Sullivan

William Phelan

Dennis Clifford

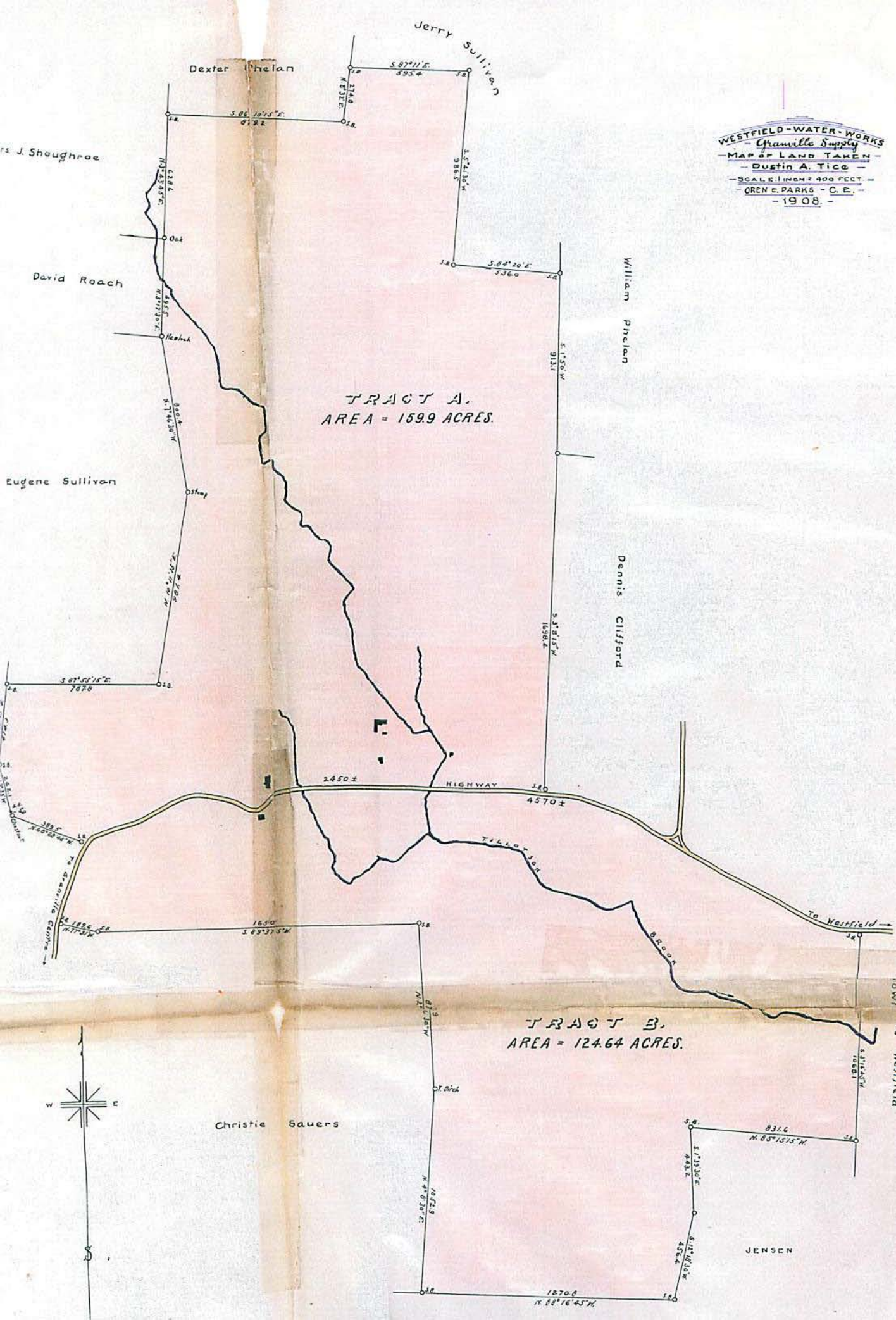
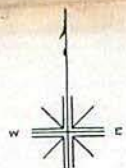
Christie Sauers

JENSEN

WESTFIELD-WATER-WORKS
Granville Supply
- MAP OF LAND TAKEN -
- DUSTIN A. TICE -
- SCALE 1 INCH = 400 FEET -
- OREN E. PARKS - C.E. -
- 1908 -

TRACT A.
AREA = 159.9 ACRES.

TRACT B.
AREA = 124.64 ACRES.



(Dustin A. Tice)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefor, KNOW ALL MEN BY THESE PRESENTS, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this seventeenth day of October, in the year nineteen hundred and eight, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise thereto appertain or belong.

Said land and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract "A". Commencing at a stone monument on the westerly side of the highway leading from said Tice property to Granville Centre and at the southeasterly corner of land supposed to belong to John Roach, thence North $68^{\circ}28'45''$ West about three hundred eighty-nine and five tenths (389.5) feet to a large chestnut tree, thence North $13^{\circ}35'$ West about five (5) feet to a stone monument, thence same course about two hundred sixty-two and one tenth (262.1) feet to a stone monument, thence North $7^{\circ}55'15''$ East about four hundred fourteen and three tenths (414.3) feet to a stone monument at land supposed to belong to Eugene Sullivan, the last three courses are along land of said Roach, thence South $87^{\circ}55'15''$ East about seven hundred eighty-seven and eight tenths (787.8) feet to a stone monument, thence North $10^{\circ}11'15''$ East about nine hundred eighty-one and four tenths (981.4) feet to a stump on the northerly side of the brook, thence North $7^{\circ}46'30''$ West about eight hundred and four tenths (800.4) feet to a hemlock tree at land supposed to belong to David Roach, the last three courses are along land of said Sullivan, thence North $3^{\circ}17'30''$ East along land of said Roach about four hundred ninety-five and five tenths (495.5) feet to an oak tree at land supposed to belong to Mrs. Shoughroe, thence North $3^{\circ}43'45''$ East along land of said Shoughroe about six hundred twenty-eight and six tenths (628.6) feet to a stone monument at land supposed to belong to Dexter Phelan, thence South $86^{\circ}10'15''$ East about eight hundred seventy-nine and two tenths (879.2) feet to a stone monument, thence North $8^{\circ}32'$ East about two hundred seventy-four and eight tenths (274.8) feet to a stone monument at land supposed to belong to Jerry Sullivan, the last two courses are along land of said Phelan, thence South $87^{\circ}11'$ East about five hundred ninety-five and four tenths (595.4) feet to a stone monument, thence South $5^{\circ}41'30''$ West about nine hundred eighty-six and five tenths (986.5) feet to a stone monument, thence South $84^{\circ}20'$ East about five hundred thirty-six (536) feet to a stone monument at land supposed to belong to William Phelan, the last three courses are along land of said Sullivan, thence South $1^{\circ}50'$ West along land of said Wm. Phelan about nine hundred thirteen and one tenth (913.1) feet to land supposed to belong to Dennis Clifford, thence South $3^{\circ}08'15''$ West along land of said Clifford about sixteen hundred ninety-eight and four tenths (1698.4) feet to a stone monument supposed to be in the northerly line of the highway, thence westerly along the highway about twenty four hundred and fifty (2450) feet to the place of beginning; containing about one hundred fifty-nine and nine tenths (159.9) acres.

Tract "B". Commencing at a stone monument in the southerly line of the highway about eight hundred (800) feet westerly of the dwelling of Dennis Clifford and at the northwesterly corner of land of the Town of Westfield formerly of one Hallbourg, thence South $3^{\circ}14'45''$ West along land of said Town about ten hundred sixty-eight and one tenth (1068.1) feet to a stone monument at land supposed to belong to one Jensen, thence North $85^{\circ}15'15''$ West about eight hundred thirty-one and six tenths (831.6) feet to a stone monument, thence South $1^{\circ}39'30''$ East about four hundred forty-three and two tenths (443.2) feet, thence South $12^{\circ}18'30''$ West about four hundred fifty-six and four tenths (456.4) feet to a stone monument at land supposed to belong to Stephen Seymour, the last three courses are along land of said Jensen, thence North $88^{\circ}16'45''$ West along land of said Seymour about twelve hundred seventy and eight tenths (1270.8) feet to a stone monument at land supposed to belong to Christie Sauers, thence North $4^{\circ}08'30''$ East about ten hundred fifty-two and nine tenths (1052.9) feet to a marked yellow birch, thence North $2^{\circ}36'30''$ West about eight hundred seventy and nine tenths (870.9) feet to a stone monument, thence South $89^{\circ}37'45''$ West about sixteen hundred fifty (1650) feet to a stone monument, thence North $77^{\circ}31'$ West about one hundred eighty-nine and six tenths (189.6) feet to a stone monument in the easterly line of the highway, the last four courses are along land of said Sauers, thence northerly and easterly along the highway about forty-five hundred and seventy (4570) feet to the place of beginning; containing about one hundred twenty-four and sixty-four one-hundredths (124.64) acres.

The two foregoing described tracts are supposed to belong to Dustin A. Tice of said Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

L. W. Hildreth.
L. J. Allen
Wm. Little

In the presence of

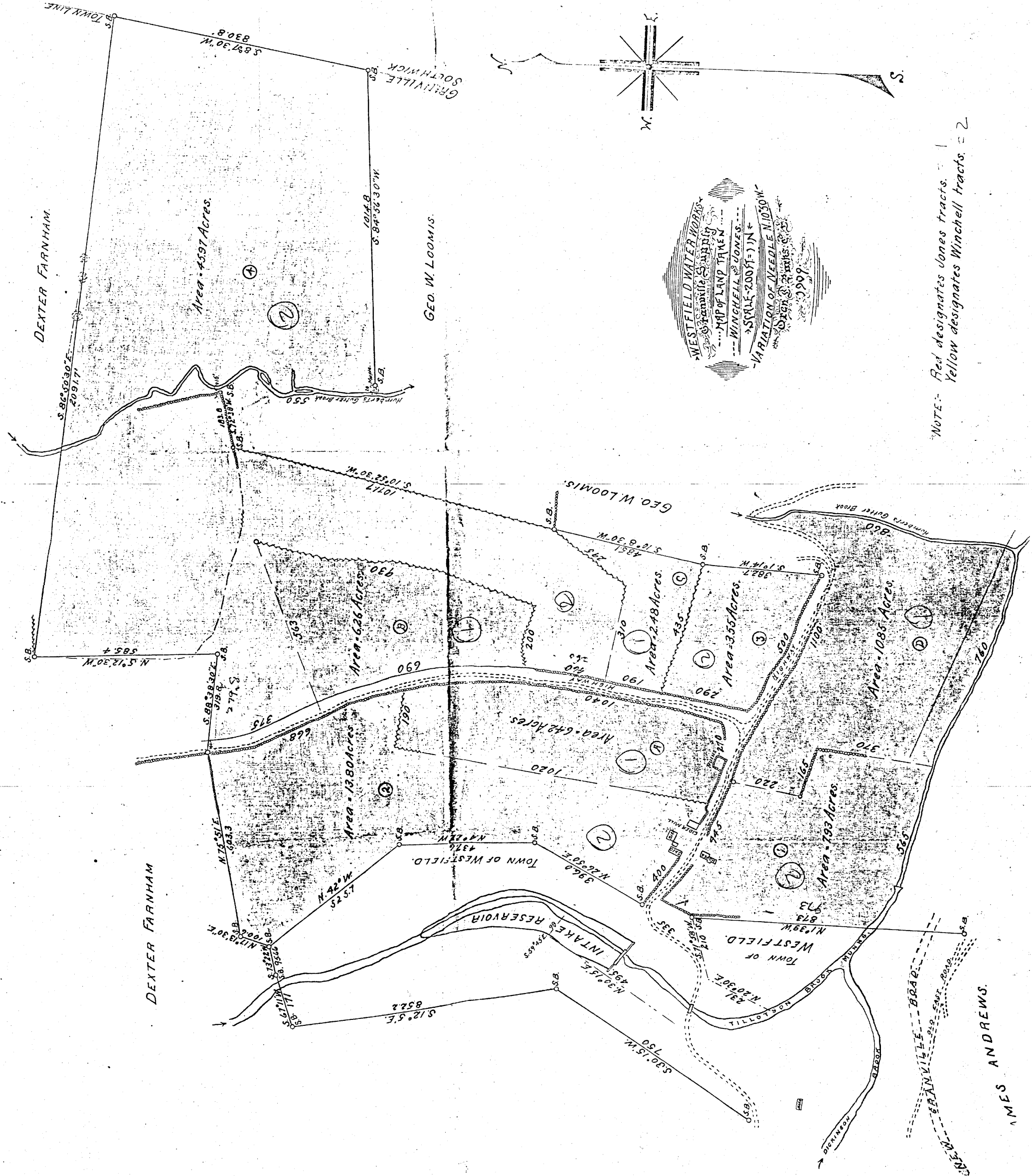
John L. Hyde

9889

HAMPDEN COUNTY REGISTRY OF DEEDS.

NOV 16 1908

Received 10 H 11 M A M



WESTFIELD WATER WORKS
TAMMIS S. W. JONES
MAP OF LAND TAKEN
WINCHELL S. JONES
SCALE 200 FT. = 1 IN.
VARIATION OF NEEDLE N. 10° 30' W.
1909

NOTE:- Red designates Jones tracts.
Yellow designates Winchell tracts. = 2

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this first day of May, in the year nineteen hundred and nine, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, there-to appertain or belong.

Said land and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract #1. Commencing at an iron monument on the southerly side of the highway at the northwesterly corner of land of Wilbur Jones, thence southerly about two hundred twenty (220) feet, thence easterly about one hundred sixty-five (165) feet, thence southerly about three hundred seventy (370) feet to Munn's Brook, the last three courses are along land of said Jones, thence westerly up the brook about five hundred sixty-five (565) feet to land of the Town of Westfield, thence North $1^{\circ}39'$ West about five hundred eighty (580) feet to a stone monument, thence South $71^{\circ}58'$ West about two hundred ten (210) feet to the highway, the last two courses are along land of said Town, thence northerly and easterly along said highway about seven hundred eighty (780) feet to the place of beginning; containing about seven and ninety-three one-hundredths (7.93) acres.

Tract #2. Commencing at a stone monument in the northerly line of the highway at the southeasterly corner of land of the Town of Westfield, thence North $26^{\circ}50'$ East about three ninety-six (396) feet to a stone monument, thence North $4^{\circ}22'$ West about four hundred thirty-seven and six tenths (437.6) feet to a stone monument, thence North 42° West about five hundred twenty-five and seven tenths (525.7) feet to a stone monument at land of Dexter Farnham, the last three courses are along land of said Town, thence North $17^{\circ}13'30''$ East about one hundred and six tenths (100.6) feet to a stone monument, thence North $75^{\circ}51'$ East about six hundred three and three tenths (603.3) feet to a stone monument on the westerly side of the highway, the last two courses are along land of said Farnham, thence southerly along the highway about six hundred sixty-eight (668) feet to land of Wilbur Jones, thence westerly about one hundred ninety (190) feet, thence southerly about one thousand twenty (1020) feet to the highway, the last two courses are along land of said Jones, thence westerly along the highway about four hundred (400) feet to the place of beginning; containing about thirteen and eight tenths (13.8) acres.

Tract #3. Commencing at a stone monument in the northerly line of the old highway leading from the Winchell place to Lambson's, thence westerly along said highway about five hundred (500) feet to the highway leading northerly to Farnham's, thence northerly along said highway about two hundred ninety (290) feet to land of Wilbur S. Jones, thence easterly along land of said Jones about four hundred thirty-five (435) feet to a stone monument at land of Geo. W. Loomis, thence South $1^{\circ}14'$ West along land of said Loomis about three hundred eighty-two and seven tenths (382.7) feet to the place of beginning; containing about three and fifty-five one-hundredths (3.55) acres.

Tract #4. Commencing at a point in the easterly line of the highway leading from Winchell's northerly to Farnham's, said point bearing South $88^{\circ}38'30''$ East forty (40) feet from a stone monument in the westerly line of said road, thence same course about two hundred

seventy-nine and eight tenths (279.8) feet to a stone monument, thence North $5^{\circ}12'30''$ West about five hundred eighty-five and four tenths (585.4) feet to a stone monument, thence South $86^{\circ}50'30''$ East about two thousand ninety-one and seven tenths (2091.7) feet to a stone monument in the Granville-Southwick Town Line, the last three courses are along land supposed to belong to Dexter Farnham, thence South $8^{\circ}07'30''$ West along said Town Line about eight hundred thirty and eight tenths (830.8) feet to a stone monument at land of Geo. W. Loomis, thence South $84^{\circ}56'30''$ West about one thousand fourteen and eight tenths (1014.8) feet to a stone monument, thence same course about twenty (20) feet to the middle of Humbert's Gutter Brook, thence northerly up the brook about five hundred fifty (550) feet, thence South $72^{\circ}38'$ West about fifteen (15) feet to a stone monument, thence same course about one hundred eighty-three and eight tenths (183.8) feet to a stone monument, thence South $10^{\circ}52'30''$ West about ten hundred seventy-one and seven tenths (1071.7) feet to a stone monument at land of Wilbur S. Jones, the last four courses are along land of said Loomis, thence southwesterly about two hundred ninety-five (295) feet, thence westerly about three hundred ten (310) feet to the highway, the last two courses are along land of said Jones, thence northerly along said highway about four hundred sixty (460) feet to other land of said Jones, thence easterly about two hundred (200) feet, thence northerly about nine hundred thirty (930) feet, thence southwesterly about five hundred sixty-three (563) feet to the highway, the last three courses are along land of said Jones, thence northerly along the highway about three hundred seventy-five (375) feet to the place of beginning; containing about forty-five and ninety-seven one-hundredths (45.97) acres.

The foregoing described tracts are supposed to belong to Artemese Winchell, widow of Henry M. Winchell of Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

S. W. Hildreth
Thos Little

In the presence of

7283

HAMPDEN COUNTY REGISTRY OF DEEDS.

JUL 10 1909

Received 10 H 15 M a.m.

(Wilbur S. Jones)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this first day of May, in the year nineteen hundred and nine, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, there-to appertain or belong.

Said land and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract "A". Commencing at a point in the northerly line of the highway at the southeasterly corner of land formerly of Henry M. Winchell thence northerly about ten hundred twenty (1020) feet, thence easterly about one hundred ninety (190) feet to the highway leading to Farnham's, the last two courses are along land formerly of said Winchell, thence southerly along the highway about ten hundred forty (1040) feet, thence westerly along the highway about two hundred seventy (270) feet to the place of beginning; containing about six and forty-two one-hundredths (6.42) acres.

Tract "B". Commencing at a point in the easterly line of the road leading to Farnham's about three hundred seventy-five (375) feet southerly along said road from land supposed to belong to Farnham, thence northeasterly about five hundred sixty-three (563) feet, thence southerly about nine hundred thirty (930) feet, thence westerly about two hundred (200) feet to the highway, the last three courses are along land formerly of Henry M. Winchell, thence northerly along the highway about six hundred ninety (690) feet to the place of beginning; containing about six and twenty-six one-hundredths (6.26) acres.

Tract "C". Commencing at a point in the easterly line of the road leading to Farnham's about four hundred sixty (460) feet southerly along said road from the southwesterly corner of Tract "B", thence easterly about three hundred ten (310) feet, thence northeasterly about two hundred ninety-five (295) feet to a stone monument at land of George W. Loomis, the last two courses are along land formerly of Henry M. Winchell, thence South $10^{\circ}08'30''$ West along land of said Loomis about four hundred eighty-five and one tenth (485.1) feet to a stone monument at land of said Winchell, thence westerly along land of said Winchell about four hundred thirty-five (435) feet to the highway, thence northerly along the highway about one hundred ninety (190) feet to the place of beginning; containing two and forty-eight one-hundredths (2.48) acres.

Tract "D". Commencing at an iron monument on the southerly side of the highway at the northeasterly corner of land formerly of Henry M. Winchell, thence easterly and northerly along said highway about eleven hundred (1100) feet to the middle of Humbert's Gutter Brook, thence southerly along said brook about eight hundred sixty (860) feet to its junction with Munn's brook, thence westerly along said Munn's brook about seven hundred sixty (760) feet to land formerly of said Winchell, thence northerly about three hundred seventy (370) feet, thence westerly about one hundred sixty-five (165) feet, thence northerly about two hundred twenty (220) feet to the place of beginning, the last three courses are along land formerly of said Winchell; containing about ten and eighty-five one-hundredths (10.85) acres.

(2)

(Wilbur S. Jones)

The foregoing described tracts are supposed to belong to Wilbur S. Jones of said Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

(*L. W. Hildyeth*)
(*Wm Little*)
(
(

In the presence of _____

7284

HAMPDEN COUNTY REGISTRY OF DEEDS.

JUL 10 1809

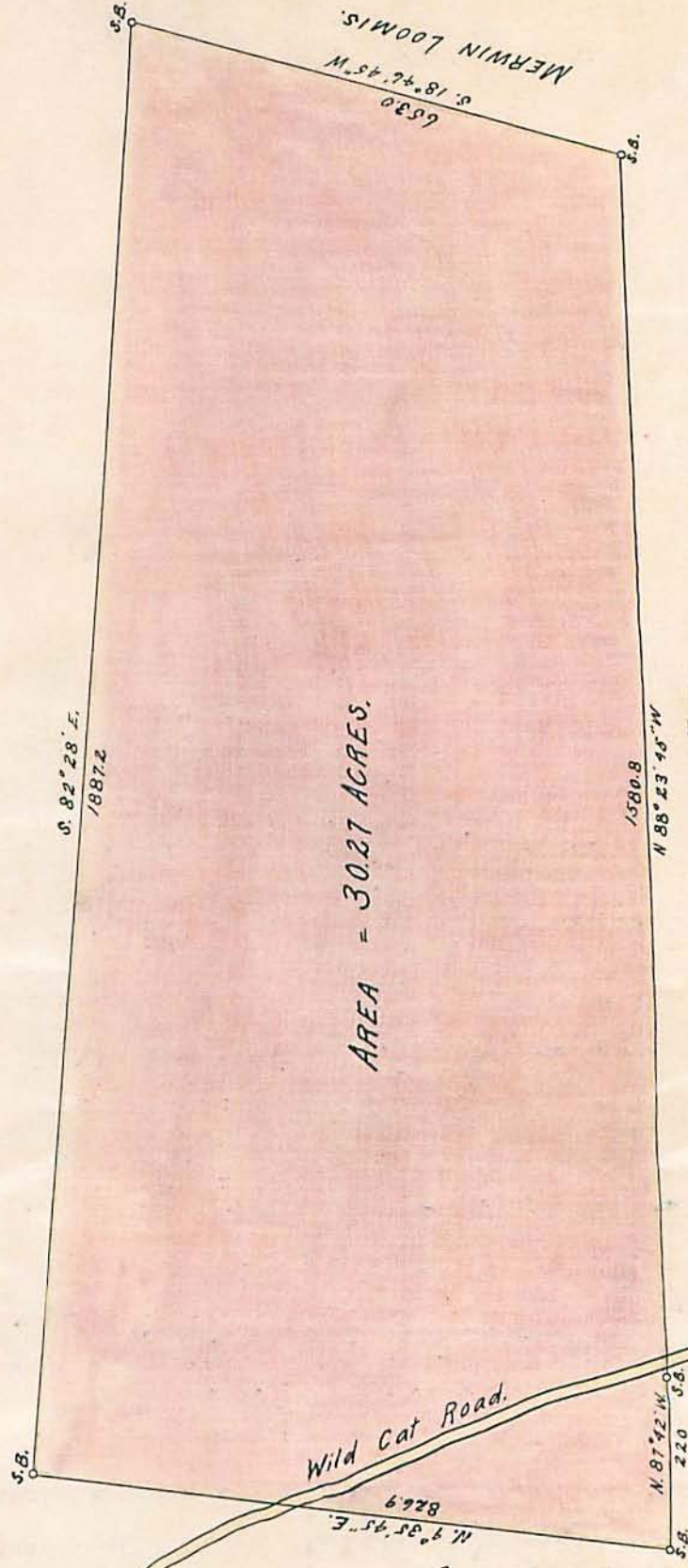
Received 10 H 15 M a.m.

13

TO THE LAND OFFICE OF THE STATE OF OHIO

RECEIVED

JAS. NOBLE'S HEIRS.



Wild Cat Road.

N. 9° 35' 45" E. 826.9

TOWN OF WESTFIELD.

Hollister Brook

GEO. LOOMIS.

WESTFIELD-WATER-WORKS
- Brantville Supply -
- MAP OF LAND TAKEN -
- V. J. FOWLER -
- SCALE: 1 INCH = 200 FEET -
- OREN F. PARKS - C.E. -
- 1909 -



(Joseph J. Fowler)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefor, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this tenth day of April, in the year nineteen hundred and nine, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument on the westerly side of the Wild Cat road at the northeasterly corner of land of Town of Westfield, thence North $87^{\circ}42'$ West about two hundred twenty (220) feet to a stone monument, thence North $9^{\circ}35'45''$ East about eight hundred twenty-six and nine tenths (826.9) feet to a stone monument, the last two courses are along land of said Town, thence South $82^{\circ}28'$ East along land supposed to belong to James Noble's Heirs about eighteen hundred eighty-seven and two tenths (1887.2) feet to a stone monument, thence South $18^{\circ}46'45''$ West along land supposed to belong to Merwin Loomis about six hundred fifty-three (653) feet to a stone monument, thence North $88^{\circ}23'45''$ West along land supposed to belong to George W. Loomis about fifteen hundred eighty and eight tenths (1580.8) feet to the place of beginning; containing about thirty and twenty-seven one-hundredths (30.27) acres exclusive of the highway.

The foregoing described tract is supposed to belong to Joseph J. Fowler of said Westfield.

In witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

(*S. W. Aldrich*)
(*W. J. Little*)

In the presence of

7285

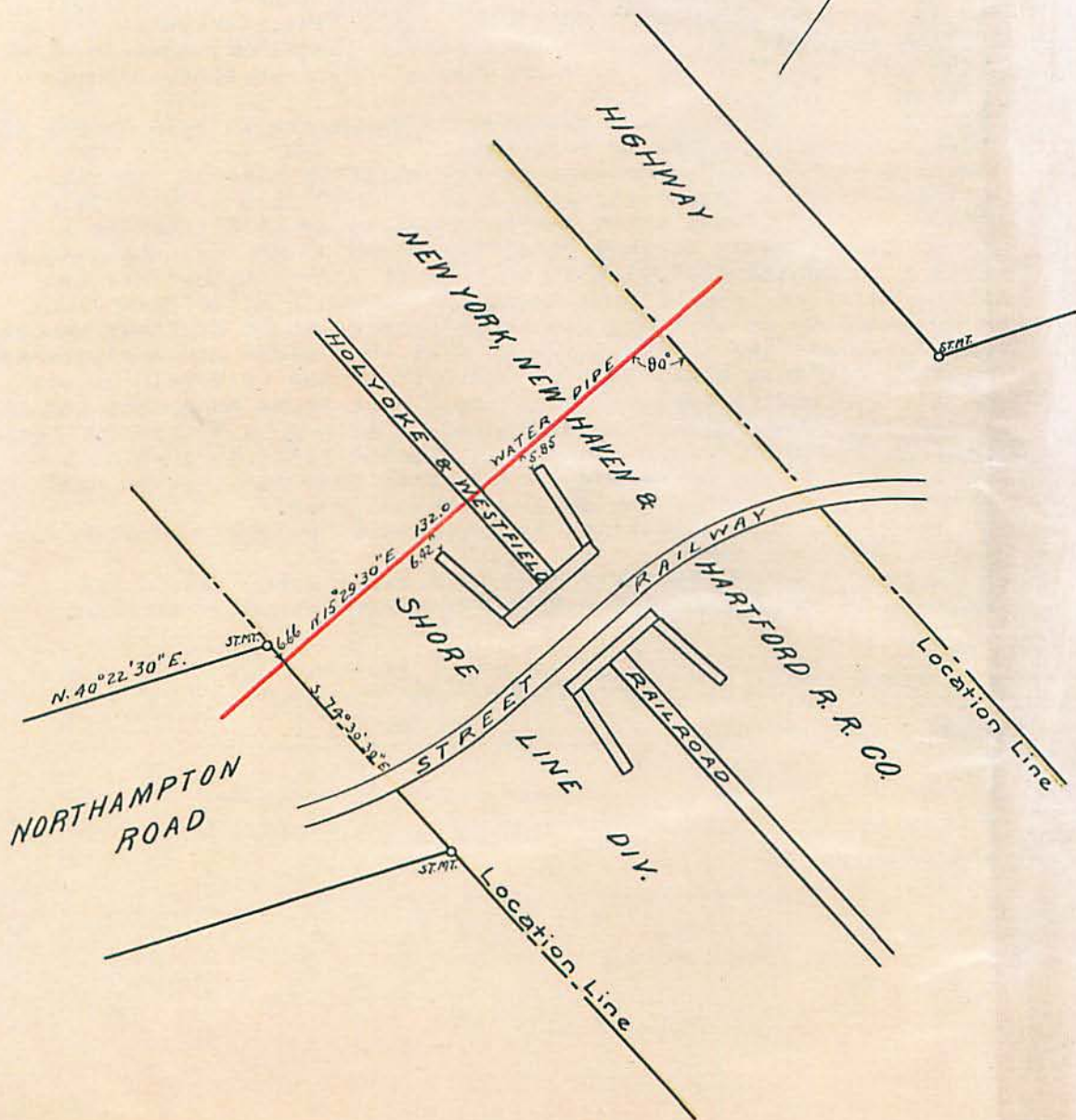
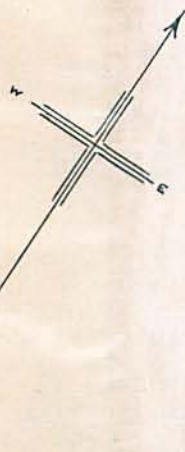
HAMPDEN COUNTY REGISTRY OF DEEDS.

JUL 10 1899

Received 10 H 15 M A.M.

WESTFIELD-WATER-WORKS

- MAP OF TAKING
- N.Y. N. H. & H. R.R. CO. -
- SCALE: 1 INCH = 40 FEET -
- ORENE PARKS - C.E. -
- 1909. -



Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of distributing such waters and for effectually carrying out the provisions of said Act, has, on this twenty-ninth day of October, in the year nineteen hundred and nine, taken the right to lay down, carry and maintain water pipe through, under and across the location of the Holyoke and Westfield Branch of the New York, New Haven & Hartford Railroad Co. along the following described line:-

Commencing at a point in the southerly location line of said Railroad Company bearing South $74^{\circ}30'30''$ East six and sixty-six one-hundredths (6.66) feet from a stone monument at the intersection of said location line with the westerly line of the Northampton highway, so called, thence North $15^{\circ}29'30''$ East one hundred thirty-two (132) feet to a point in the northerly location line of said Railroad Company.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

L. W. Hildreth
Wm. Little
S. A. Allen

In the presence of

Wm. C. Root

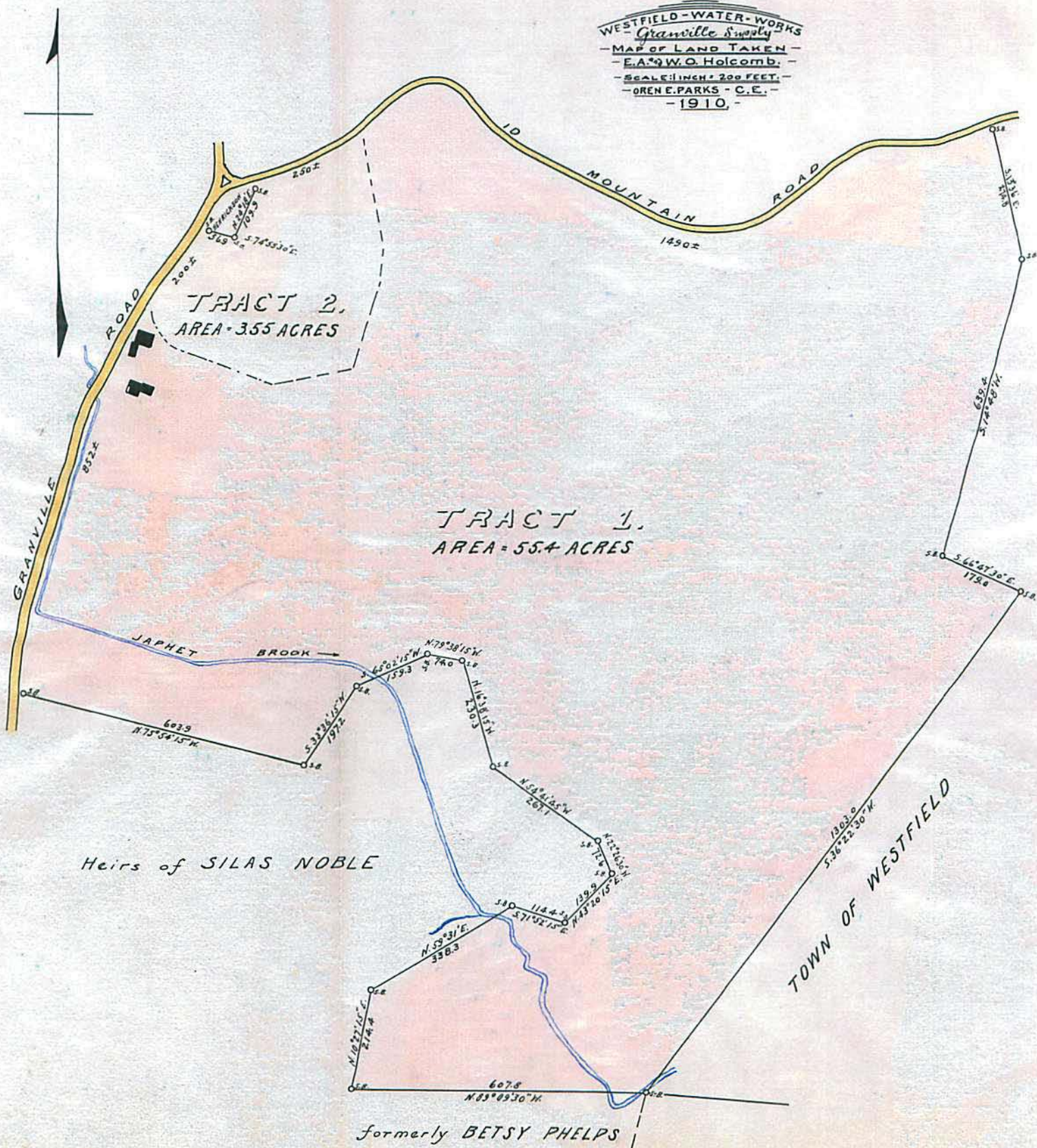
12982

MASSACHUSETTS REGISTRY OF DEEDS

DEC 10 1909

Received 4 H 55 M P.M.

WESTFIELD-WATER-WORKS
Granville Supply
 - MAP OF LAND TAKEN -
 - E.A. & W.O. HOLCOMB. -
 - SCALE: 1 INCH = 200 FEET -
 - OREN E. PARKS - C.E. -
 - 1910 -



Whereas, by Chapter three hundred and forty-two of the Acts passed by the General court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefor, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this eighteenth day of March, in the year nineteen hundred and ten, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract #1. Commencing at a stone monument on the southerly side of the Id Mountain road at the northwesterly corner of land of said Town of Westfield, formerly of William J. Leahey, thence South $13^{\circ}36'$ East about two hundred seventy-four and eight tenths (274.8) feet to a stone monument, thence South $14^{\circ}48'$ West about six hundred thirty-nine and four tenths (639.4) feet to a stone monument, thence South $66^{\circ}47'30''$ East about one hundred seventy-nine (179) feet to a stone monument, thence South $36^{\circ}22'30''$ West about thirteen hundred and three (1303) feet to a stone monument, the four preceeding courses are along land of the Town of Westfield, thence North $89^{\circ}09'30''$ West along land formerly of Betsy Phelps about six hundred seven and eight tenths (607.8) feet to a stone monument at land of the Heirs of Silas Noble, thence North $10^{\circ}27'15''$ East about two hundred fourteen and four tenths (214.4) feet to a stone monument, thence North $59^{\circ}31'$ East about three hundred thirty-eight and three tenths (338.3) feet to a stone monument, thence South $71^{\circ}52'15''$ East about one hundred fourteen and four tenths (114.4) feet to a stone monument, thence North $43^{\circ}20'15''$ East about one hundred thirty-nine and nine tenths (139.9) feet to a stone monument, thence North $22^{\circ}26'30''$ West about seventy-two and six tenths (72.6) feet to a stone monument, thence North $54^{\circ}41'45''$ West about two hundred sixty-seven and one tenth (267.1) feet to a stone monument, thence North $16^{\circ}38'15''$ West about two hundred thirty and three tenths (230.3) feet to a stone monument, thence North $79^{\circ}38'15''$ West about seventy-four (74) feet to a stone monument, thence South $65^{\circ}02'15''$ West about one hundred fifty-nine and three tenths (159.3) feet to a stone monument, thence South $33^{\circ}36'15''$ West about one hundred ninety-seven and two tenths (197.2) feet to a stone monument, thence North $75^{\circ}54'15''$ West about six hundred three and nine tenths (603.9) feet to a stone monument on the easterly side of the Old Granville road, the eleven preceeding courses are along land of the Heirs of Silas Noble, thence northerly along said road about eight hundred fifty-two (852) feet to land supposed to belong to W. O. Holcomb, thence easterly and northerly along land supposed to belong to said W. O. Holcomb to the Id Mountain road, so called, thence easterly along said road about fourteen hundred ninety (1490) feet to the place of beginning, containing about fifty-five and four tenths (55.4) acres. The foregoing described tract is supposed to belong to Elizabeth A. Holcomb of said Granville.

Tract #2. Commencing at a stone monument on the easterly side of the Old Granville road at the southwesterly corner of land of Peter Henrickson, thence South $74^{\circ}55'30''$ East about fifty-six and nine tenths (56.9) feet to a stone monument, thence North $24^{\circ}18'$ East about one hundred nine and nine tenths (109.9) feet to a

(2)

(Elizabeth A. & William O. Holcomb)

stone monument on the southerly side of the Id Mountain road, the two preceeding courses are along land of said Henrickson, thence easterly along the Id Mountain road about two hundred fifty (250) feet to land supposed to belong to Elizabeth A. Holcomb, thence southerly and westerly along said land to the Old Granville road, thence northerly along the Old Granville road about two hundred (200) feet to the place of beginning, containing about three and fifty-five one-hundredths (3.55) acres.

The foregoing described tract is supposed to belong to W. O. Holcomb of said Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

(E. J. Allen)
(Thos Little)
(S. W. Holcomb)

In the presence of

John E. Parks

3196

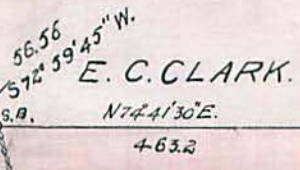
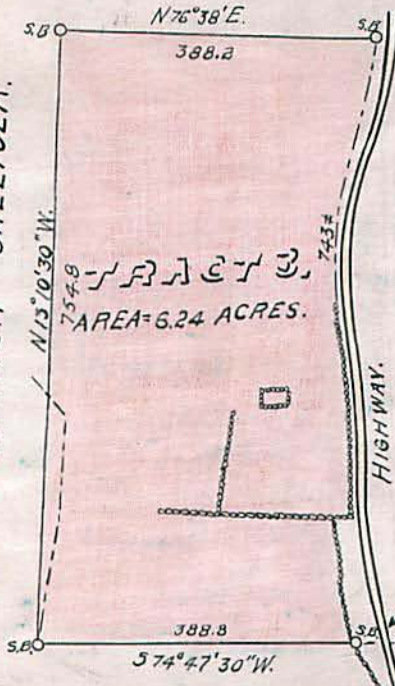
HAMPDEN COUNTY REGISTRY OF DEEDS.

APR 4 1910

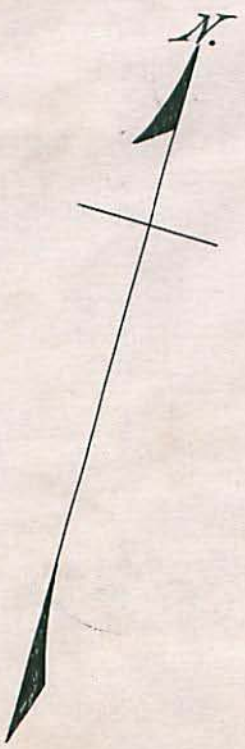
Received 3 H 12 M P.M.

WESTFIELD - WATER - WORKS
Montgomery Supply
 - MAP OF LAND TAKEN -
 - Stephen Consolatti -
 - SCALE: 1 INCH = 200 FEET -
 - OREN E. PARKS - C.E. -
 - 1910 -

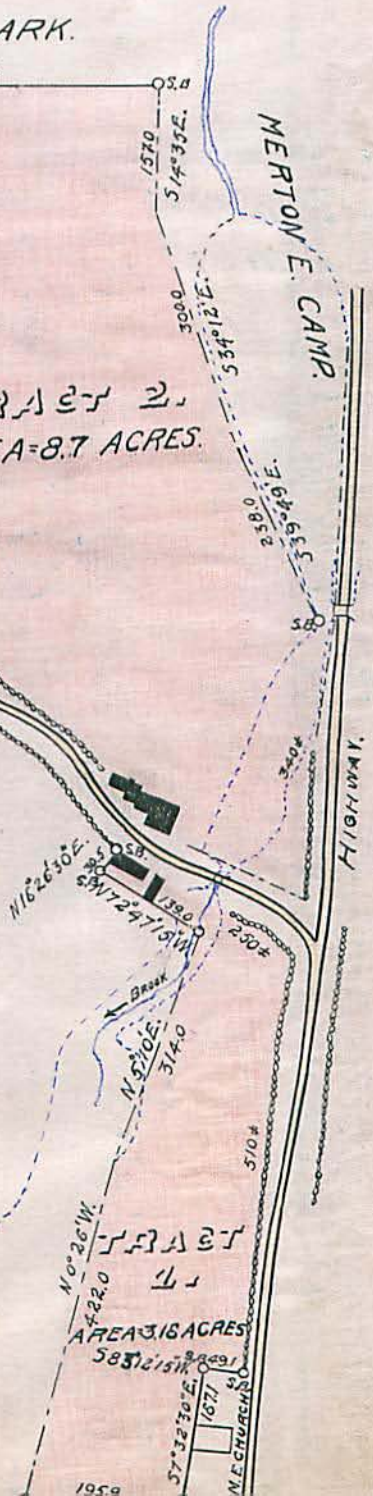
PATRICK GALLIGER.



DAVID L. ALLYN.



DAVID L. ALLYN



MERTON E. CAMP.

HIGHWAY.

(Stephen Consolatti)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this twenty-fifth day of March, in the year nineteen hundred and ten, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Montgomery in said County of Hampden, and are described as follows:-

Tract #1. Commencing at a stone monument on the westerly side of the highway at the northeasterly corner of the M. E. Church Lot, thence South $83^{\circ}12'15''$ West about forty-nine and one tenth (49.1) feet to a stone monument, thence South $7^{\circ}32'30''$ East about one hundred sixty-seven and one tenth (167.1) feet to a stone monument at land of David L. Allyn, the two preceding courses are along said M. E. Church Lot, thence South $75^{\circ}20'30''$ West about one hundred ninety-five and nine tenths (195.9) feet, thence North $0^{\circ}26'$ West about four hundred twenty-two (422) feet, thence North $5^{\circ}10'$ East about three hundred fourteen (314) feet, thence North $72^{\circ}47'15''$ West about one hundred thirty-nine (139) feet to a stone monument, thence North $16^{\circ}26'30''$ East about thirty and five tenths (30.5) feet to a stone monument on the southerly side of the highway, the last five courses are along land of said David L. Allyn, thence easterly about two hundred fifty (250) feet to the first mentioned highway, thence southerly along said highway about five hundred ten (510) feet to the place of beginning, containing about three and sixteen one-hundredths (3.16) acres.

Tract #2. Commencing at a stone monument on the westerly side of the highway near the bridge, thence southerly along the highway about three hundred forty (340) feet to the junction with a highway leading to the west, thence westerly and northerly along said highway about twelve hundred fifty-five (1255) feet to a stone monument at land of E. C. Clark, thence North $74^{\circ}41'30''$ East along land of said Clark about four hundred sixty-three and two tenths (463.2) feet to a stone monument at land of Merton E. Camp, thence South $14^{\circ}35'$ East about one hundred fifty-seven (157) feet, thence South $34^{\circ}12'$ East about three hundred (300) feet, thence South $39^{\circ}49'$ East about two hundred thirty-eight (238) feet to the place of beginning, the last three courses are along land of said Camp, containing about eight and seven tenths (8.7) acres.

Tract #3. Commencing at a stone monument on the westerly side of the highway, bearing South $72^{\circ}59'45''$ West about fifty-six and fifty-six one-hundredths (56.56) feet from the stone monument at the north-westerly corner of Tract #2, thence South $74^{\circ}47'30''$ West along land of David L. Allyn about three hundred eighty-eight and eight tenths (388.8) feet to a stone monument at land supposed to belong to Patrick Galliger, thence North $13^{\circ}10'30''$ West along land of said Galliger about seven hundred fifty-four and eight tenths (754.8) feet to a stone monument at land of C. A. Williams, thence North $76^{\circ}38'$ East along land of said Williams about three hundred eighty-eight and two tenths (388.2) feet to a stone monument on the westerly side of the highway, thence southerly along the highway about seven hundred

(2)

(Stephen Consolatti)

forty-three (743) feet to the place of beginning, containing about six and twenty-four one-hundredths (6.24) acres.

The foregoing described tracts are supposed to belong to Stephen Consolatti of said Montgomery.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

(S. A. Allen)
(S. H. Gilduff)
(Thos Little)

In the presence of

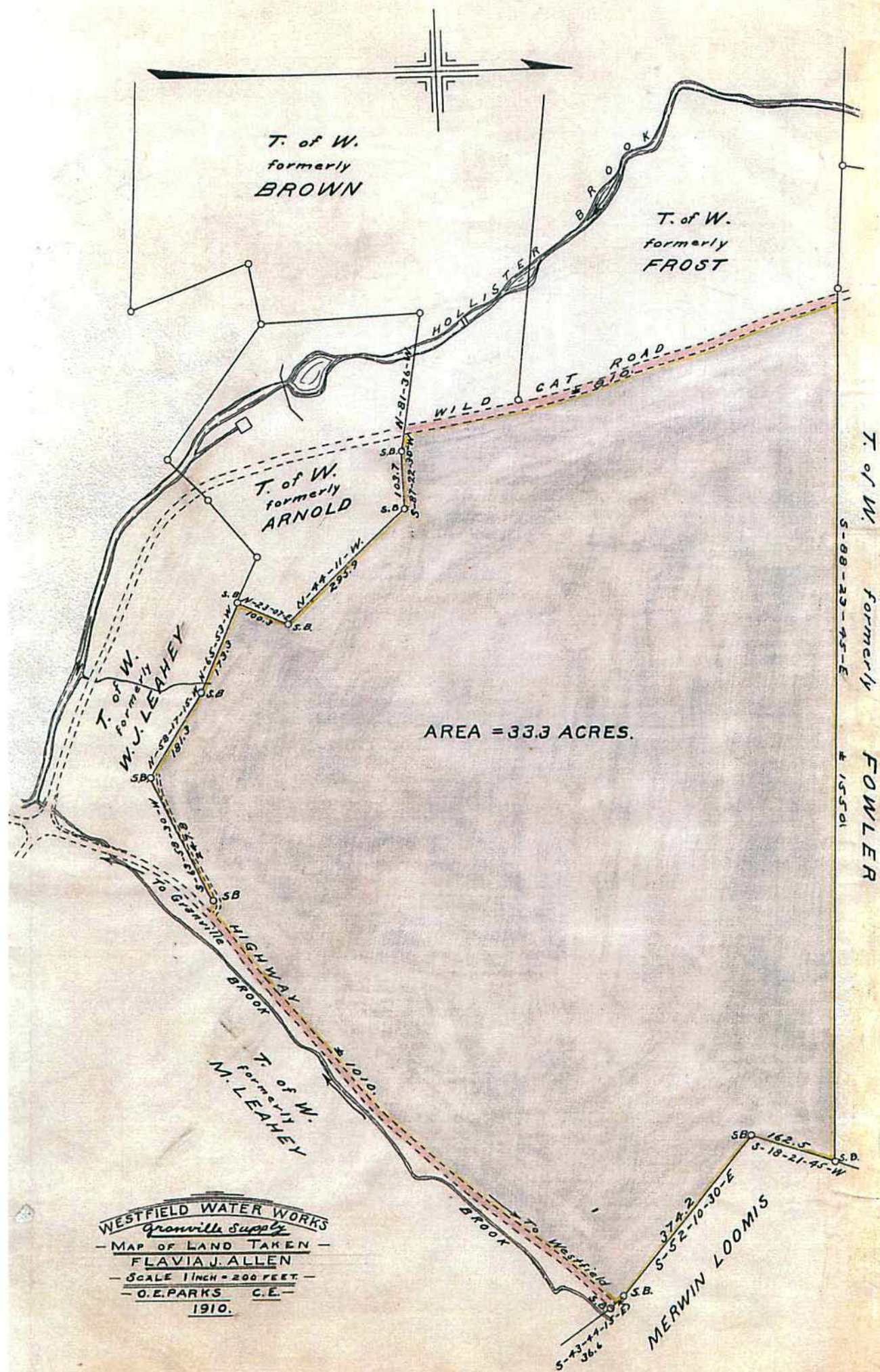
Geo. R. Keefe

3197

HAMPDEN COUNTY REGISTRY OF DEEDS.

APR 4 1910

Received 3 H. 12 M. P.m.



Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this first day of December in the year nineteen hundred and ten, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said land and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument on the westerly side of the highway leading from Westfield to Granville and at the northeasterly corner of land of said Inhabitants, formerly of W. J. Leahey, as shown on plan filed in Hampden County Registry of Deeds Aug. 8, 1906, thence S. 63° 58' 30" W. two hundred forty-seven and eight tenths (247.8) feet to a stone monument, thence N. 58° 17' 15" W. one hundred eighty-one and three tenths (181.3) feet to a stone monument, thence N. 65° 53' W. one hundred seventy-three and three tenths (173.3) feet to a stone monument at land formerly of one Arnold, now of said Inhabitants, the last three courses are along land formerly of said Leahey now of said Inhabitants, thence N. 23° 07' E. one hundred and three tenths (100.3) feet to a stone monument, thence N. 44° 11' W. two hundred ninety-five and nine tenths (295.9) feet to a stone monument, thence S. 87° 22' 30" W. one hundred three and seven tenths (103.7) feet to a stone monument, thence N. 81° 36' W. to the Wild-Cat Road, so called, the last four courses are along land formerly of one Arnold now of said Inhabitants, thence northerly along the road about eight hundred ten (810) feet to land formerly of one Fowler now of said Inhabitants, thence S. 88° 23' 45" E. along said land about fifteen hundred fifty (1550) feet to a stone monument at land supposed to belong to Merwin Loomis, thence S. 18° 21' 45" W. one hundred sixty-two and five tenths (162.5) feet to a stone monument, thence S. 52° 10' 30" E. three hundred seventy-four and two tenths (374.2) feet to a stone monument on the westerly side of the highway leading from Westfield to Granville, the last two courses are along land of said Loomis, thence southwesterly along the highway about ten hundred ten (1010) feet to the place of beginning, containing about thirty-three and three tenths (33.3) acres. The foregoing described tract is supposed to belong to Flavia J. Allen of Westfield, Mass.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.

{ *S. J. Allen*
 Thos. Little
 S. W. Hildreth

In the presence of *Orin E. Parks*

WESTFIELD WATER WORKS
GRANVILLE SUPPLY
MAP OF LAND TAKEN
NELLIE SHOUGHRUE McDONALD

Scale 1 inch = 200 feet.

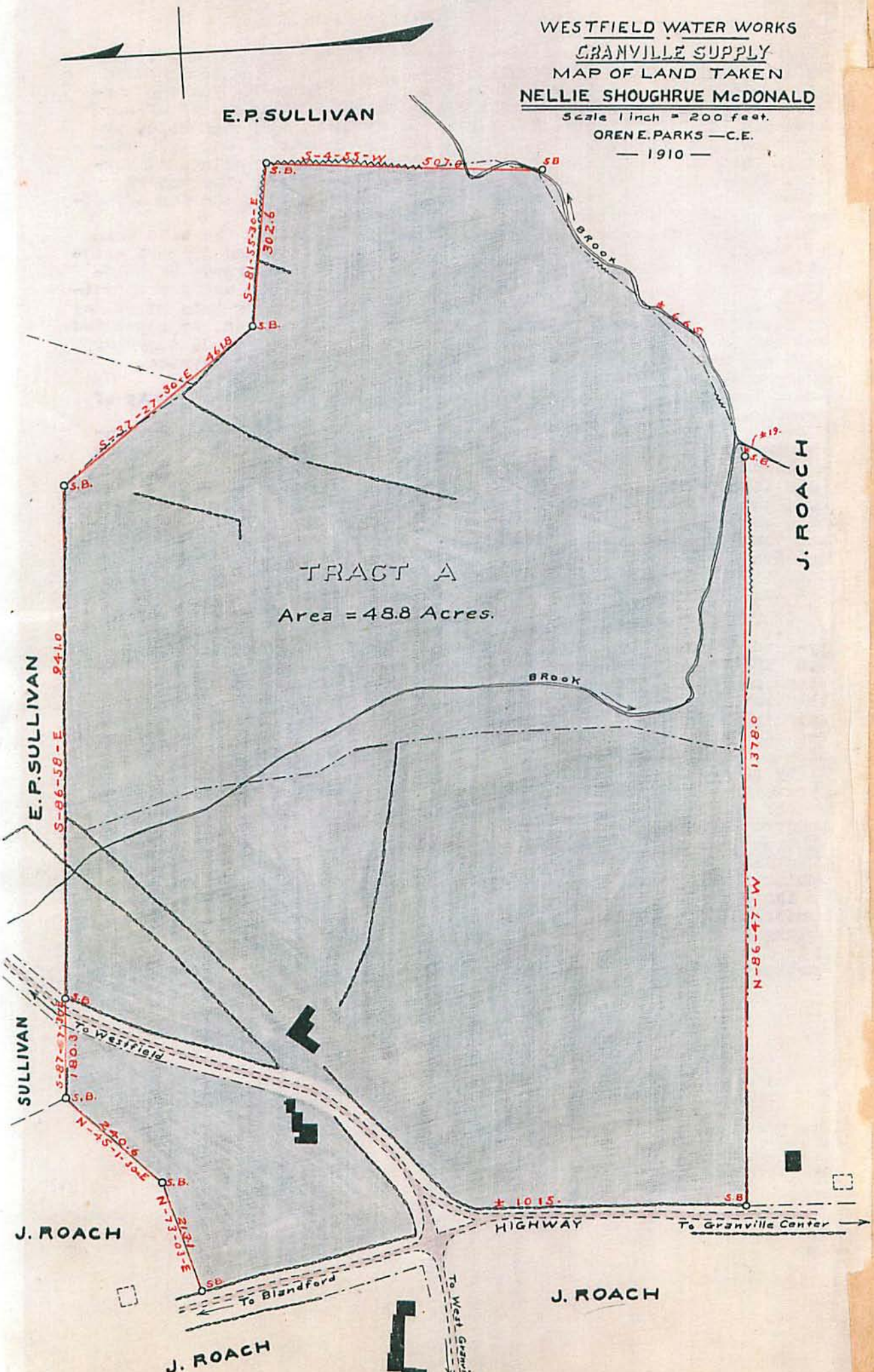
OREN E. PARKS — C.E.

— 1910 —

E. P. SULLIVAN

J. ROACH

TRACT A
Area = 48.8 Acres.



(Nellie Shoughrue McDonald)

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this first day of December in the year nineteen hundred and ten, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:- Tract "A",

Commencing at a stone monument on the easterly side of highway leading from West Granville to Westfield and in the southerly line of land of E. P. Sullivan, thence S. 86°58'E. nine hundred forty-one (941.0) feet to a stone monument, thence S. 37°27'30"E. four hundred sixty-one and eight tenths (461.8) feet to a stone monument, thence S. 81°55'30"E. three hundred two and six tenths (302.6) feet to a stone monument, thence S. 4°55'W. five hundred seven (507.0) feet to a stone monument on the easterly side of a brook at land supposed to belong to John Roach, the last four courses are along land of E. P. Sullivan, thence southwesterly up the brook about six hundred sixty-five (665) feet to a point, thence N. 86°47'W. about nineteen (19) feet to a stone monument, thence same course thirteen hundred seventy-eight (1378.0) feet to a stone monument in the easterly line of the highway leading to Granville Center, the last three courses are along land of John Roach, thence northerly along the highway, crossing the road leading from West Granville to Westfield, about ten hundred fifteen (1015) feet to a stone monument at land of John Roach, thence N. 73°03'E. two hundred thirteen and one tenth (213.1) feet to a stone monument, thence N. 45°01'30"E. two hundred forty and six tenths (240.6) feet to a stone monument at land of E. P. Sullivan, the last two courses are along land of said Roach, thence S. 87°07'30"E. crossing the highway leading from West Granville to Westfield, one hundred eighty and three tenths (180.3) feet to the place of beginning, containing about forty-eight and eight tenths (48.8) acres, exclusive of area of West Granville and Westfield Highway within said described tract.

Tract "B". Commencing at a stone monument on the easterly side of the highway leading from West Granville to Westfield and in the northerly line of land of David L. Roach, thence northerly along said highway about seven hundred eighty-five (785) feet to a stone monument at land supposed to belong to one Phelon, thence S. 70°56'E. along said land seven hundred seventy-nine and two tenths (779.2) feet to a stone monument at land of the Town of Westfield, formerly of Dustin Tice, thence S. 3°43'45"W. along said land six hundred twenty-eight and six tenths (628.6) feet to an Oak Tree, thence South 3°17'30"W. sixty (60.0) feet to land of David L. Roach, thence N. 77°15'20"W. along said land ten hundred thirty-nine and five tenths (1039.5) feet to the place of beginning, containing fifteen and one tenth (15.1) acres.

The foregoing described tracts formerly were supposed to belong to Nellie Shoughrue McDonald and the record title is now in the said Town of Westfield.

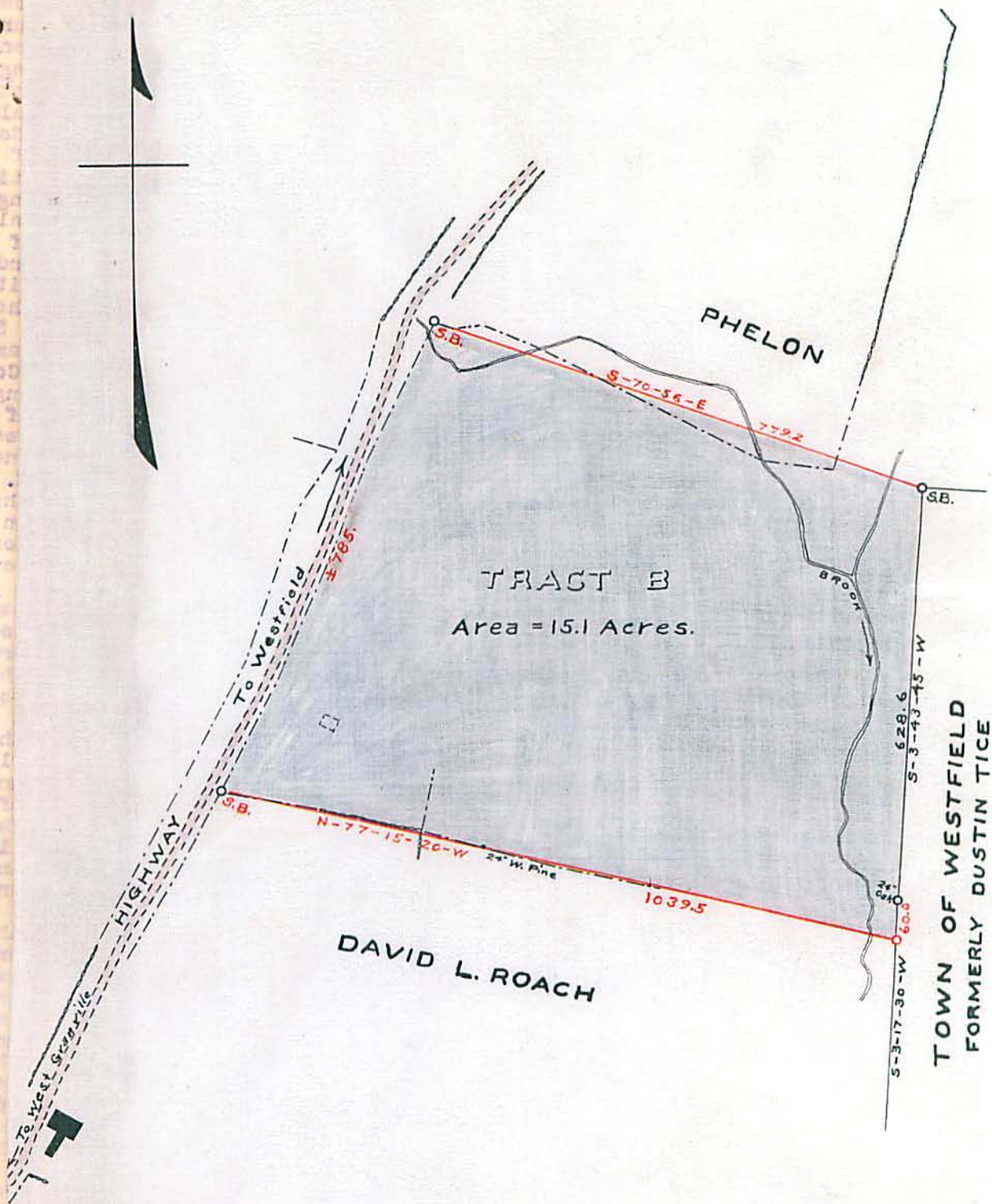
In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners.-

{ S. A. Allen
{ S. W. Wilder
{ Thos. Little

In the presence of

..... Geo. P. Tenife



TOWN OF WESTFIELD
FORMERLY DUSTIN TICE

WESTFIELD WATER WORKS
GRANVILLE SUPPLY
MAP OF LAND TAKEN
NELLIE SHOUGHRUE McDONALD

Scale 1 inch = 200 feet.

OREN E. PARKS - C.E.

— 1910 —

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this ninth day of March in the year nineteen hundred and twelve, taken, appropriated and now holds the land and property herein-after described together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument on the westerly side of the highway leading from Westfield to Granville at land of Town of Westfield, formerly of Flavia J. Allen, thence N. $52^{\circ}10'30''$ W. about three hundred seventy-four and two tenths (374.2) feet to a stone monument; thence N. $18^{\circ}21'45''$ E. about one hundred sixty-two and five tenths (162.5) feet to a stone monument at land of Town of Westfield, formerly of J.J. Fowler, the last two courses being along land formerly of Allen, thence N. $18^{\circ}46'45''$ E. along land formerly of J.J. Fowler about six hundred fifty-three (653) feet to a stone monument at land of heirs of James Noble; thence S. $82^{\circ}47'$ E. along land of said heirs about fifteen hundred seventy-six (1576) feet to a stone monument on the westerly side of said highway leading from Westfield to Granville; thence southwesterly along said highway about seventeen hundred fifty (1750) feet to the place of beginning, containing about twenty-two (22) Acres. The foregoing described tract formerly was supposed to belong to Andrusia Noble et. als. and the record title is now in the Town of Westfield.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

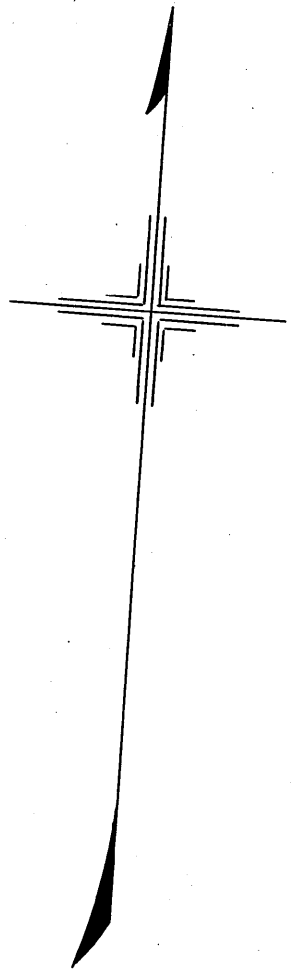
Board of
Water Commissioners.

S. A. Allen
Jas. S. Darnin

In the presence of

Jos. P. Gifford

WESTFIELD-WATER-WORKS
Granville Supply
- MAP OF LAND TAKEN -
- Sarah E. Hollister -
- SCALE: 1 INCH = 200 FEET -
- J.L. Hyde - C.E. -
- 1912 -



TOWN OF WESTFIELD
FORMERLY
MICHAEL LEAHEY

AREA = 168.5 ACRES

HOLLISTER

BROOK

W. J. LEAHEY

C. KELLOGG

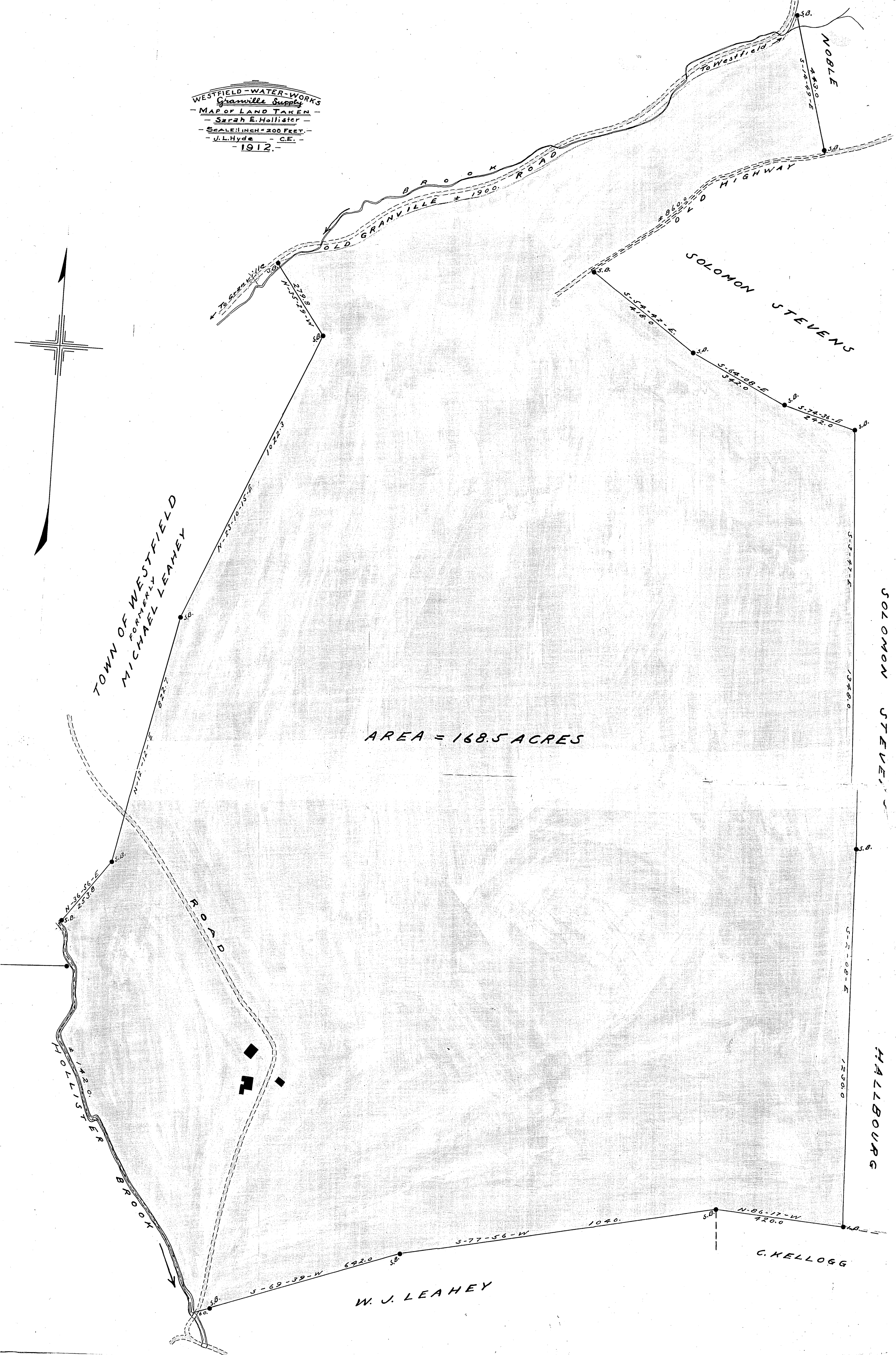
HALLBOURG

SOLOMON STEVEN

SOLOMON STEVENS

NOBLE

BROOK ROAD
OLD GRANVILLE # 1900
To Westfield
To Westfield



Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this first day of February in the year nineteen hundred and twelve, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone bound on the southerly side of the Old Granville Road at land of Town of Westfield, formerly of Michael Leahey; thence northeasterly along said highway about nineteen hundred (1900) feet to a stone monument at land of Noble; thence S.14°49'E. about four hundred forty-three (443) feet along land of said Noble to a stone monument at land of Solomon Stevens; thence same course fifteen (15) feet to the center of old highway; thence southwesterly along center of said highway about eight hundred sixty (860) feet; thence S.54°42'E. about ten (10) feet to a stone monument; thence same course about four hundred eighteen (418) feet to a stone monument; thence S.64°08'E. about three hundred forty two (342) feet to a stone monument; thence S.74°36'E. about two hundred forty two (242) feet to a stone monument; thence S. 3°47'E. about thirteen hundred forty-eight (1348) feet to a stone monument, the last five courses being along land of said Solomon Stevens; thence S.2°8'E. about twelve hundred thirty (1230) feet along land of said Stevens and land of Hallbourg to an iron monument at land of Clifford Kellogg; thence N.86°17'W. about four hundred twenty (420) feet to a stone monument at land of W. J. Leahey, the last course being along land of said Clifford Kellogg; thence S.77°56'W. about ten hundred forty (1040) feet to a stone monument; thence S.69°39'W. about six hundred forty-two (642) feet to a stone monument; thence same course about sixty (60) feet to the center of Hollister brook; thence northerly along said brook about fourteen hundred ~~hundred~~ twenty (1420) feet to land of Town of Westfield, formerly of Michael Leahey; thence N.36°56'E. about twenty (20) feet to a stone monument; thence same course about two hundred fifty-three and eight tenths (253.8) feet to a stone monument; thence N.12°12'E. about eight hundred twenty-two and seven tenths (822.7) feet to a stone monument; thence N.23°10'15"E. about ten hundred twenty-two and three tenths (1022.3) feet to a stone monument; thence N.35°29'W. about two hundredseventy-nine and eight tenths (279.8) feet to the place of beginning, the last four courses being along land of along land of Town of Westfield, formerly of Michael Leahey. The above described tract containing about one hundred sixty-eight and five tenths (168.5) acres. The foregoing described tract is supposed to belong to Sarah E. Hollister of Hartford, Connecticut.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners

S. H. Allen
Wm. Little
L. W. Hildreth

In the presence of

Geo. P. Ruff

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know all Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has on this ninth day of March in the year nineteen hundred and twelve, taken appropriated and now holds the land and property hereinafter described together with any and all rights of way and easements which, in any-wise, thereto appertain or belong.

Said land and property are situated in Granville in said County of Hampden and are described as follows:-

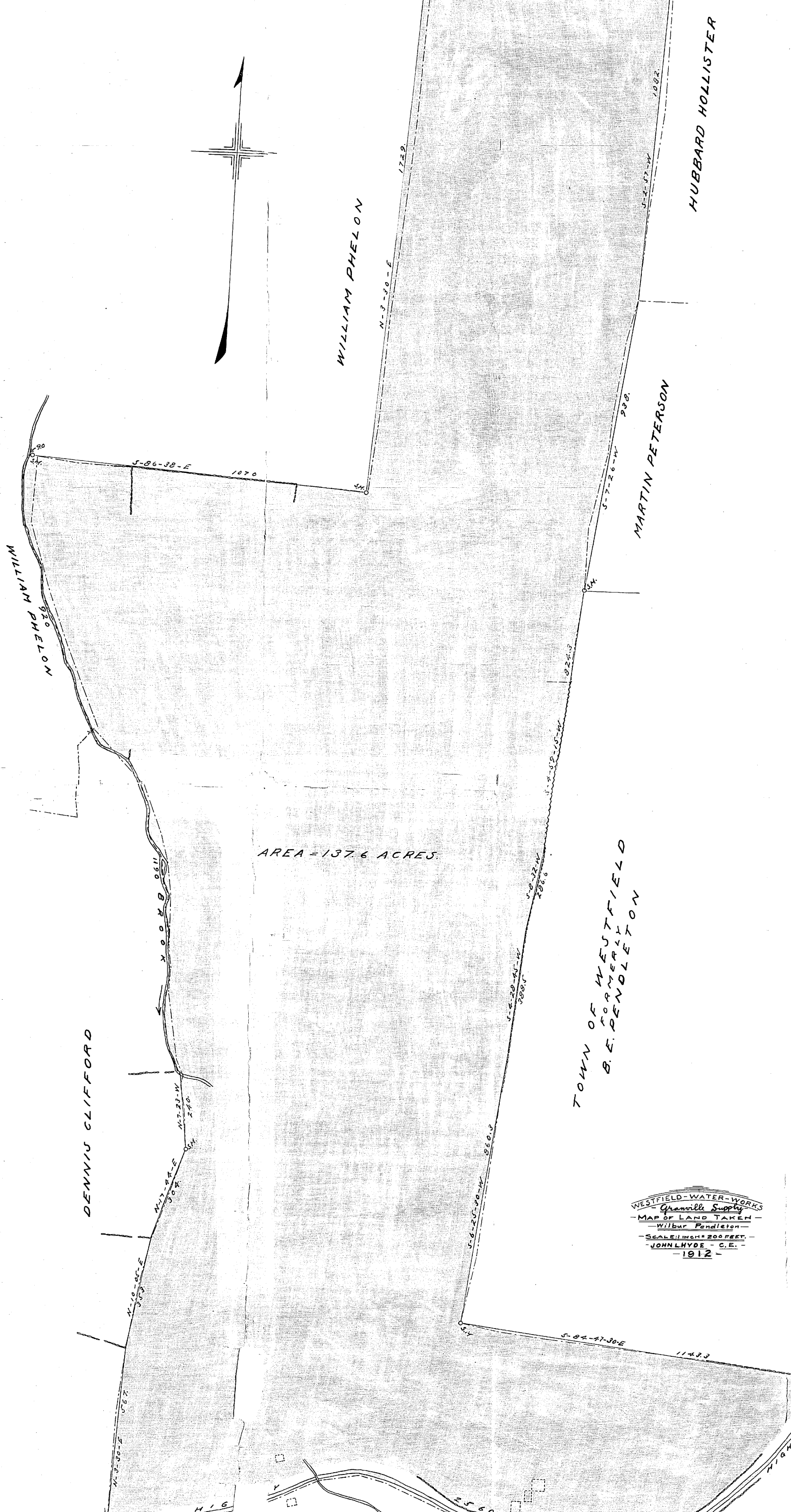
Commencing at a stone monument on the northerly side of the highway at land of Dennis Clifford; thence N. $3^{\circ}30'$ E. about five hundred sixty-seven (567) feet; thence N. $10^{\circ}5'$ E. about three hundred fifty-three (353) feet; thence N. $17^{\circ}44'$ E. about three hundred four (304) feet to a stone monument; thence N. $7^{\circ}23'$ W. about two hundred forty (240) feet to the center of the brook; thence northerly along said brook about eleven hundred ninety (1190) feet to land of William Phelon, the last five courses being along land of Dennis Clifford; thence northerly along said brook about nine hundred twenty (920) feet; thence S. $86^{\circ}38'$ E. about nine (9) feet to a stone monument; thence same course about ten hundred seventy (1070) feet to a stone monument; thence N. $3^{\circ}30'$ E. about seventeen hundred twenty-nine (1729) feet to a stone monument at land of Jerry Sullivan, the last three courses being along land of said Phelon; thence N. $85^{\circ}45'$ E. along land of said Sullivan about four hundred twenty-five (425) feet to a stone monument at land of Town of Westfield, formerly of Michael Arnold; thence S. $86^{\circ}38'30''$ E. along said land, about three hundred fifty-three and three tenths (353.3) feet to a stone monument at land of Hubbard Hollister; thence S. $2^{\circ}57'$ W. along land of said Hollister about ten hundred eighty-two (1082) feet to land of Martin Peterson; thence S. $7^{\circ}26'$ W. along land of said Peterson about nine hundred thirty-eight (938) feet to a stone monument at land of Town of Westfield, formerly of B. E. Pendleton; thence S. $4^{\circ}59'15''$ W. about eight hundred twenty-four and three tenths (824.3) feet; thence S. $8^{\circ}32'$ W. about two hundred eighty-six and six tenths (286.6) feet; thence S. $4^{\circ}28'45''$ W. about three hundred eighty-eight and five tenths (388.5) feet; thence S. $6^{\circ}25'30''$ W. about eight hundred sixty and three tenths (860.3) feet to a stone monument; thence S. $84^{\circ}47'30''$ E. about eleven hundred forty-three and three tenths (1143.3) feet to a stone monument on the northerly side of the said highway, the last five courses being along land of Town of Westfield; thence westerly along said highway about twenty-five hundred sixty (2560) feet to the place of beginning, containing about one hundred thirty-seven and six tenths (137.6) Acres. The foregoing described tract formerly was supposed to belong to Wilbur Pendleton and the record title is now in the Town of Westfield.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners.

In the presence of



WILLIAM PHELON

WILLIAM PHELON

HUBBARD HOLLISTER

MARTIN PETERSON

DENNIS CLIFFORD

TOWN OF WESTFIELD
FORMERLY
B. E. PENDLETON

AREA = 137.6 ACRES.

WESTFIELD-WATER-WORKS
- Granville Supply
- MAP OF LAND TAKEN -
- Wilbur Pendleton -
- SCALE: 1 INCH = 200 FEET -
- JOHN LHYDE - C.E. -
- 1912 -

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this fourth day of November in the year nineteen hundred and twelve, taken, appropriated and now holds the land and property hereinafter described together with any and all rights of way and easements which, in anywise, thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract #1. Commencing at a stone monument on the easterly side of the highway leading from Westfield to West Granville at the southwest corner of the school house lot of the Town of Granville, thence South $56^{\circ}22'30''$ East about eighty-five (85.0) feet to a stone monument, thence North $34^{\circ}25'30''$ East about ninety-five and nine tenths (95.9) feet to a stone monument at land of Michael Arnold, the preceding courses are along land of the Town of Granville, thence South $83^{\circ}24'$ East about one thousand ninety (1090.0) feet to a stone monument, thence South $4^{\circ}57'$ East about one hundred sixty-five (165.0) feet to a marked twelve (12) inch sassafras tree, thence South $27^{\circ}55'$ East about ninety-three (93.0) feet to a stone monument, thence South $80^{\circ}30'$ East about three hundred forty-seven (347.0) feet to a stone monument at land of One Sullivan, the last four courses are along land of said Arnold, thence South $2^{\circ}48'$ West about five hundred thirty-five (535.0) feet to a stone monument, thence North $83^{\circ}34'$ West about one thousand and forty-one (1041.0) feet to a stone monument, thence South $5^{\circ}08'$ West about six hundred seventeen (617.0) feet to a stone monument at land of Town of Westfield, formerly of Tice, the last three courses are along land of said Sullivan, thence South $8^{\circ}32'$ West about two hundred seventy-four and eight tenths (274.8) feet to a stone monument, thence North $86^{\circ}10'15''$ West about eight hundred seventy-nine and two tenths (879.2) feet to a stone monument at land of Town of Westfield, formerly of McDonald, thence North $70^{\circ}56'$ West about seven hundred seventy-nine and two tenths (779.2) feet to a stone monument on the easterly side of said highway, the last three courses are along land of Town of Westfield, thence northeasterly along said highway about eighteen hundred forty-five (1845.0) feet to the place of beginning, containing about sixty and seventy-five one hundredths (60.75) Acres.

Tract #2. Commencing at a stone monument on the westerly side of the highway opposite Tract #1 at the southerly corner of the tract described and at land of said Arnold, thence North $46^{\circ}58'$ West about nine hundred eighty-eight (988.0) feet to a stone monument, thence North $10^{\circ}50'$ East about two hundred eighty-five (285.0) feet to a stone monument, thence South $83^{\circ}14'$ East about eight hundred sixty-four (864.0) feet, thence South $76^{\circ}02'$ East about one hundred eighty (180.0) feet to a stone monument, thence North $65^{\circ}42'$ East about two hundred twenty-five (225.0) feet to a stone monument, thence easterly along wall about two hundred eighty-three (283.0) feet to a stone monument on the westerly side of the road leading to the Calvin Rose place, said monument bearing South $83^{\circ}44'$ East about two hundred seventy-nine (279.0) feet

WESTFIELD WATER WORKS
 GEORVILLE SUPPLY
 MAP OF LAND TAKEN
 Mary J. Phelan
 SCALE: 1 INCH = 200 FEET
 JOHN HYDE, C.E.
 1912

PHELAN

TRACT 4,
 AREA = 44.88 ACRES

ARNOLD

ARNOLD

ARNOLD

ARNOLD

TRACT 2,
 AREA = 18.40 ACRES

ARNOLD

TRACT 1,
 AREA = 60.75 ACRES

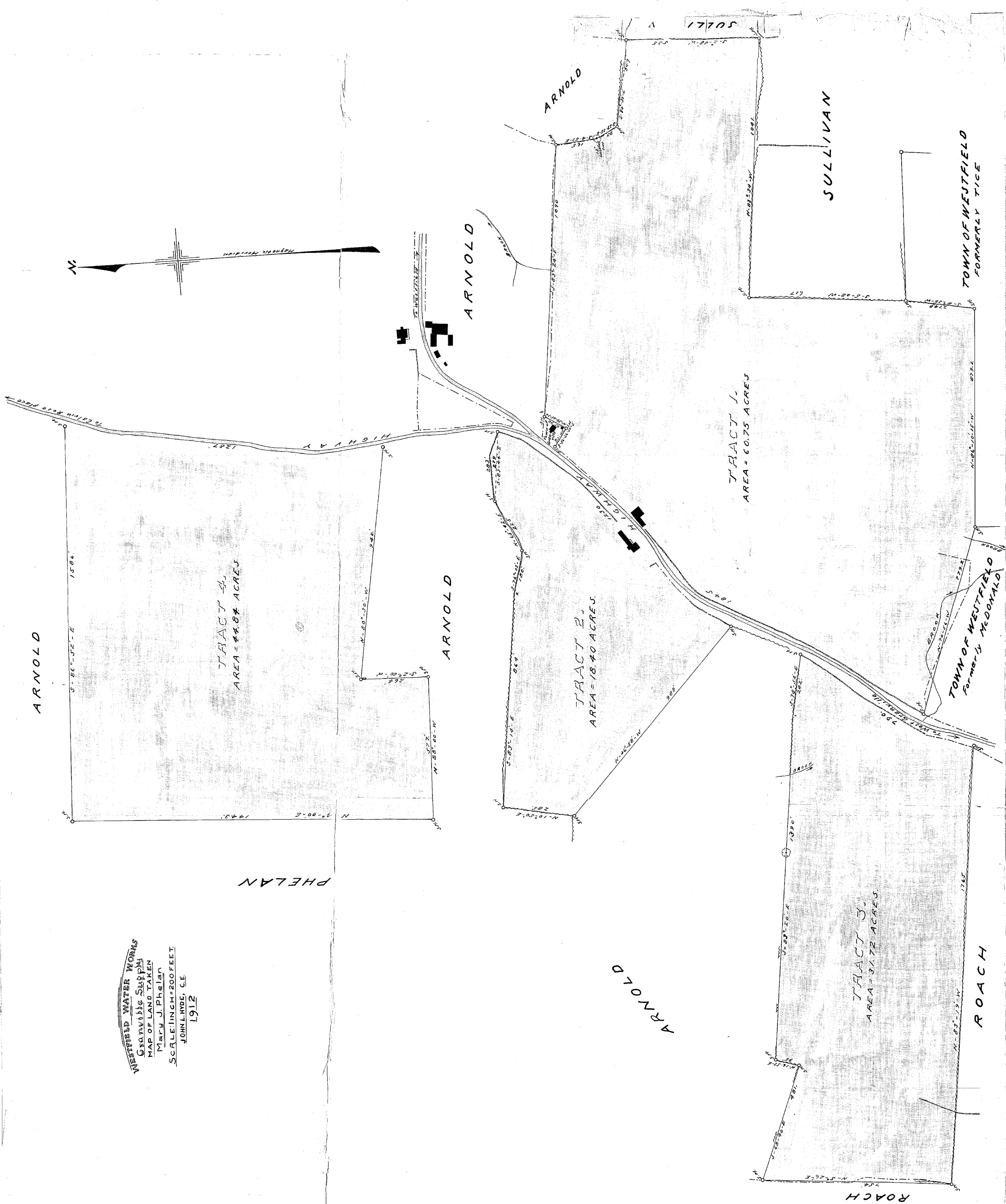
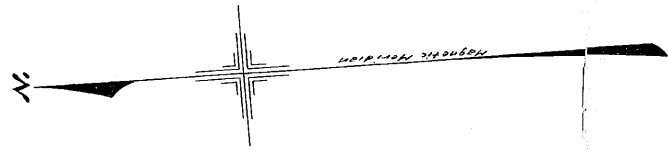
SULLIVAN

TRACT 3,
 AREA = 31.72 ACRES

ROACH

TOWN OF WESTFIELD
 Formerly McDONALD

TOWN OF WESTFIELD
 FORMERLY TICE



from last described monument, the preceeding courses are along and of said Arnold, thence southwesterly along the highway about twelve hundred thirty (1230.) feet to the place of beginning, containing about eighteen and four tenths (18.4) Acres.

Tract #3. Commencing at a stone monument on the westerly side of the highway opposite Tract 1. and south of Tract #2 at the northeasterly corner of land of one Roach, thence North $83^{\circ}19'$ West about seventeen hundred sixty-five (1765.0) feet to a stone monument, thence North $5^{\circ}26'$ East about seven hundred fifty-four (754.0) feet to a stone monument at land of one Arnold, the last two courses being along land of said Roach, thence South $68^{\circ}40'$ East about four hundred eighty-one (481.0) feet to a stone monument, thence North $16^{\circ}53'$ East about ninety-five (95.0) feet to a stone monument, thence South $83^{\circ}20'$ East about thirteen hundred ninety (1390.0) feet, thence South $78^{\circ}52'$ East about two hundred forty-two (242.0) feet to a stone monument on the westerly side of the said highway, the last four courses being along land of said Arnold, thence Southwesterly along said highway about seven hundred ninety (790.0) feet to the place of beginning, said Tract containing about thirty-one and seventy-two one hundredths (31.72) Acres.

Tract #4. Commencing at a stone monument on the easterly side of the road leading to the Calvin Rose place in the northerly line of land of one Arnold, thence North $80^{\circ}30'$ West about nine hundred forty (940.0) feet to a stone monument, thence South 2° West about two hundred sixty-four (264.0) feet to a stone monument, thence North 88° West about five hundred seventy-seven (577.0) feet to a stone monument at land of Phelan, the three courses being along land of said Arnold, thence North East along land of said Phelan about fourteen hundred forty-three (1443.0) feet to a stone monument at land of said Arnold, thence South $86^{\circ}52'$ East along land of said Arnold about fifteen hundred eighty-six (1586.0) feet to a stone monument on the westerly side of the road leading to the said Calvin Rose place, thence southerly along said road about twelve hundred eighty-seven (1287.0) feet to the place of beginning, said Tract containing about forty-four and eighty-four one hundredths (44.84) Acres.

The foregoing described tracts are supposed to belong to Mary J. Phelan of Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners

(S. A. Allen)
(A. W. Fildes)
()
()

In the presence of

672

HAMPDEN Co REGISTRY OF DEEDS
RECEIVED AND RECORDED

JAN 15 1913

AT 2 00 - M P M

TOWN OF WESTFIELD
FORMERLY OF
HARRIET E. FROST

$$\frac{3.88 \times 10^{-10}}{4.5 \times 10^{-7}}$$

TOWN OF WESTFIELD
FORMERLY OF
LUCY M. BROWN ET AL.³⁴

$$\frac{3.87 \times 10^{-11}}{9.52 \times 10^{-12}}$$

AREA = 58.4 ACRES

17862

5-88-45-5

MARTIN PETERSON

WESTFIELD WATER WORKS
Granville Supply
MAP OF LAND TAKEN
Hubbard Hollister
SCALE: 1 inch = 200 feet
JOHN L. HYDE C. E.
1913.

TOWN OF W.
FORMERLY OF
M.F. ARNOLD.

A hand-drawn sketch map showing a road labeled 'DAYTON' and a creek labeled 'WILD CAT CREEK'. The road is depicted as a double line, and the creek is a single line. They intersect at a point. The map is oriented with 'DAYTON' at the top and 'WILD CAT CREEK' at the bottom.

555 *
OLD GRANVILLE

TOWN OF WESTFIELD
FORMERLY OF



Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts, in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters, taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this eight day of October in the year of nineteen hundred and thirteen, taken, appropriated and now holds the land and property hereinafter described together with any and all rights of way and easements which, in anywise thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument on the westerly side of the old Granville Road, so called, at northeasterly corner of land of Town of Westfield, formerly of Michael Leahey, thence S. 75° 56' W. about eightyand two tenths(80.2) feet to the end of a wall on the west side of Hollister Brook, so called, thence S. 55°25' W. about seventy-six and eight tenths (76.8) feet, thence S. 25°12'30" W. about thirty-one and nine tenths (31.9) feet to a stone monument, thence N. 89° 55' W. about one hundred seventy-two and nine tenths (172.9) feet to a marked oak tree, thence S. 80°42' W. about one hundred eighty and six tenths(180.6) feet to a stone monument, thence N. 26° 40' W. about one hundred fifty-six and eight tenths (156.8) feet to a marked butternut tree, thence S. 82°03' W. about four hundred thirty-five and five tenths (435.5) feet to a stone monument at land of Martin Peterson, the preceeding courses are along land of said Town of Westfield, thence S. 89°45' W. about fourteen hundred eighty-six (1486.0) feet along land of said Peterson, to a stone monument at land of Town of Westfield, formerly of Wilbur Pendleton, thence N.- 2°57' E. about ten hundred eighty-two (1082.0) feet along land formerly of said Pendleton to a stone monument at land of Town of Westfield, formerly of Michael E. Arnold; thence N. 4°59' E. along land formerly of said Arnold about five hundred five and six tenths (505.6) feet to a stone monument at land of Town of Westfield, formerly of Harriett M. Frost; thence S. 88°43' 30" E. along land formerly of said Frost, about six hundred fifty-eight and seven tenths (658.7) feet to a stone monument at land of Town of Westfield, formerly of Lucy M. Brown et.als., thence S. 1°24'30" W. about seven hundred seventy-one and seven tenths (771.7) feet to a stone monument, thence S. 87°52' E. about nine hundred fifty-two and five tenths (952.5) feet to a stone monument, thence N- 20°50'15" W. about two hundred thirty and nine tenths (230.9) feet to a stone monument, thence N. 74°28' E. about one hundred fourteen and two tenths (114.2) feet to a stone monument at land of Town of Westfield, formerly of Michael E. Arnold, the last four courses are along land formerly of Brown, et.als. thence S. 54°15'30" E. about two hundred ninety-six (296.0) feet to a stone monument, thence N. 46°32' E. about fifty-two and five tenths (52.5) feet to a point on the westerly

side of the Wild Cat road, the last two courses are along
and formerly of said Arnold, thence southeasterly along
said road, about six hundred sixty (660.0) feet to a point
on the westerly side of said old Granville road, thence
easterly along said road about five hundred thirty-five
(535.0) feet to the place of beginning, containing about
fifty-eight and four tenths (58.4) Acres.

The foregoing described tracts are supposed to belong
to Hubbard Hollister of Granville.

In Witness Whereof, the said Town of Westfield has caused
this instrument to be signed by the Water Commissioners of
said Town.

Board of
Water Commissioners

(
(
J. W. Hildreth.
Geo. S. Darrow

in the presence of _____

14161

HAMPDEN Co REGISTRY OF DEEDS
RECEIVED AND RECORDED

OCT 21 1913

AT 8 00 30 M a M

TOWN OF WESTFIELD FORMERLY DUSTIN TICE

WESTFIELD-WATER-WORKS
Granville Supply
- MAP OF LAND TAKEN -
- David L. Roach Est. -
- SCALE 1 INCH = 200 FEET -
- JOHN L. HYDE - C.E. -
- 1913.

TOWN OF WESTFIELD
FORMERLY McDONALD

E. P. SULLIVAN

TRACT #1
AREA 14.3 ACRES.

TRACT #2.
AREA 50.3 ACRES.

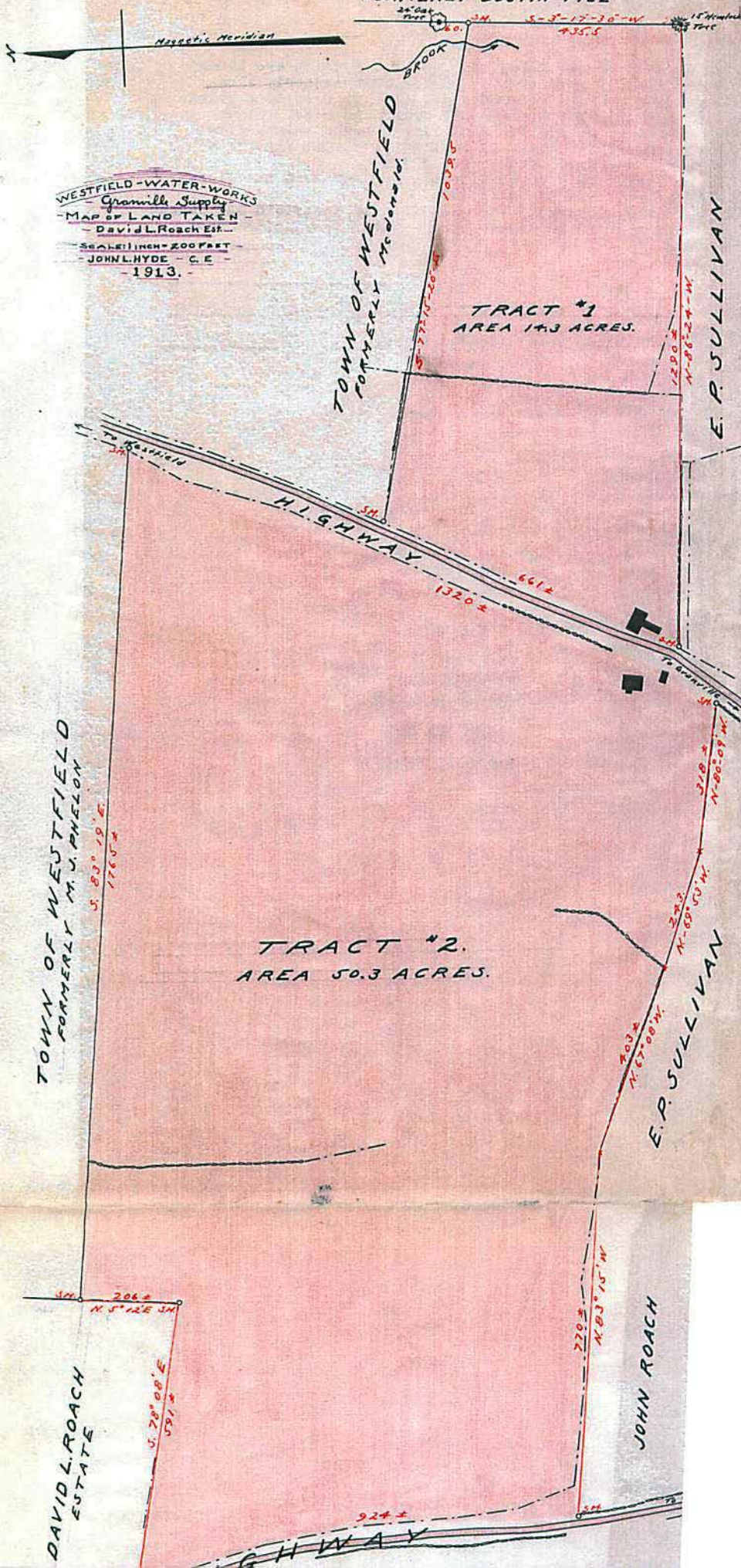
TOWN OF WESTFIELD
FORMERLY M. J. PHELAN

E. P. SULLIVAN

JOHN ROACH

DAVID L. ROACH
ESTATE

CHWY



Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this first day of October in the year nineteen hundred and thirteen, taken, appropriated and now holds the land and property hereinafter described together with any and all rights of way and easements which, in anywise hereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract #1. Commencing at a stone monument on the easterly side of the highway leading from Westfield to West Granville at the southwesterly corner of land of the Town of Westfield, formerly of Nellie S. McDonald, thence S. 77°15'20" E. along land of said Town, about one thousand thirty-nine and five tenths (1039.5) feet to a stone monument, thence S. 3°17'30" W. along land of said Town, about four hundred thirty-five and five tenths (435.5) feet to a fifteen (15) inch hemlock at land of E. P. Sullivan, thence N. 86°24' W. along land of said Sullivan about twelve hundred ninety (1290.0) feet to a stone monument on the easterly side of said highway, thence northerly along said highway, about six hundred sixty-one (661.0) feet to the place of beginning, containing about fourteen and three tenths (14.3) Acres.

Tract #2. Commencing at a stone monument on the westerly side of said highway from Westfield to West Granville at the northeasterly corner of land of said E. P. Sullivan, thence N. 80°09' W. about three hundred eighteen (318.0) feet, thence N. 69°53' W. about two hundred forty-three (243.0) feet, thence N. 67°08' W. about four hundred three (403.0) feet, thence N. 43°15' W. about seven hundred seventy (770.0) feet to a stone monument on the easterly side of the highway leading from Blandford to Granville, the preceding courses are along land of E. P. Sullivan, and land of John Roach, thence northerly along said Blandford road, about nine hundred twenty-four (924.0) feet to a stone monument, thence S. 78°08' E. about five hundred ninety-one (591.0) feet to a stone monument, thence N. 5°12' E. about two hundred six (206.0) feet to a stone monument at land of said Town, formerly of Mary J. Phelon, the last two courses are along land of Roach, Est, thence S. 83°19' E. along land of said Town about seventeen hundred sixty-five (1765.0) feet to a stone monument at the westerly side of said Westfield-West Granville highway, thence southerly along said highway about thirteen hundred twenty (1320.0) feet to the place of beginning, containing about fifty and three tenths (50.3) Acres.

The foregoing described tracts are supposed to belong to David L. Roach, Estate of Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners

(*S. H. Allen*)
(*S. W. Eldred*)
()

In the presence of

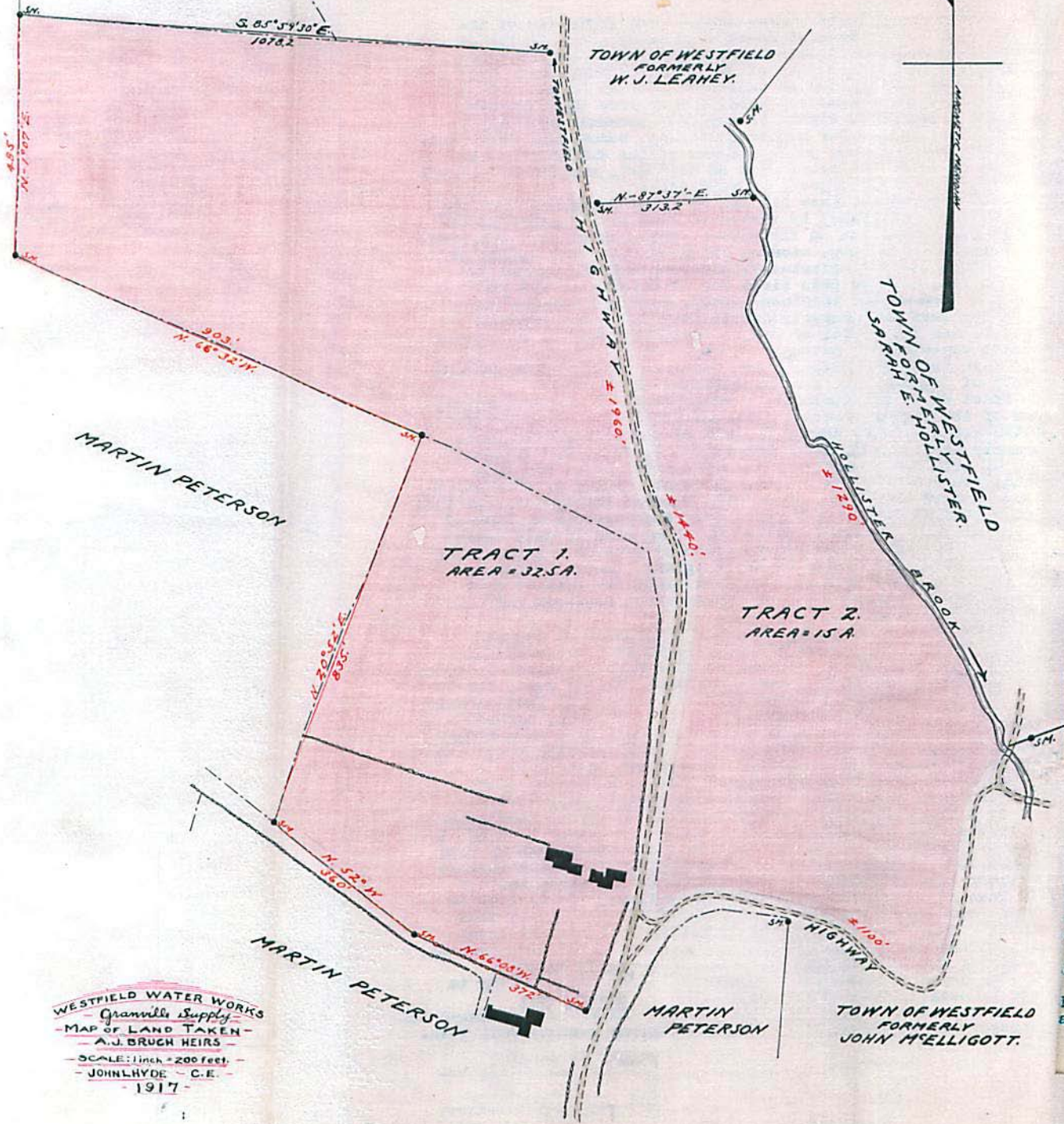
TOWN OF WESTFIELD
FORMERLY MICHAEL LEANEY.

N.



TOWN OF WESTFIELD
FORMERLY W. J. LEANEY.

TOWN OF WESTFIELD
FORMERLY E. HOLLISTER.



A. J. Bruch

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts, in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any the waters, taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said

Now, Therefore, Know All Men By These Presents, that the said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this fifth day of June in the year nineteen hundred and seventeen, taken, appropriated and now holds the land and property hereinafter described together with any and all rights of way and easements which, in anywise thereto pertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Tract #1. Commencing at a stone monument on the westerly side of the old Granville road at the northeasterly corner of land of Martin Peterson, thence North 66° 08' West about three hundred seventy-two (372) feet to a stone monument, thence North 52° West about three hundred sixty (360) feet to a stone monument, thence North 20° 52' East about eight hundred thirty-five (835) feet to a stone monument, thence North 66° 32' West about nine hundred three (903) feet to a stone monument, thence North 1° 07' East about four hundred eighty-five (485) feet to a stone monument at land of the Town of Westfield, formerly of Michael Leahey, the preceding courses are along land of said Peterson, thence South 5° 59' 30" East along land of said Town about one thousand seventy-eight and two tenths (1078.2) feet to a stone monument on the westerly side of said Granville road, thence southerly along said road about nineteen hundred sixty (1960) feet to the place of beginning, containing about thirty-two and five tenths (32.5) acres.

Tract #2. Commencing at a stone monument on the easterly side of said Granville road at the southwesterly corner of land of the Town of Westfield, formerly of W. J. Leahey, thence North 87° 37' East along land of said Town about three hundred thirteen and two tenths (313.2) feet to a stone monument on the bank of the Hollister Brook at land of said Town, formerly of Sarah E. Hollister, thence southeasterly along said brook about twelve hundred ninety (1290) feet to the old road leading easterly from the Granville road opposite the dwelling of said Peterson, thence southerly and westerly along said road about eleven hundred (1100) feet to the Granville road, thence northerly along said Granville road about fourteen hundred forty (1440) feet to the place of beginning, containing about fifteen (15) acres.

The foregoing described tracts are supposed to belong to the Heirs of A. J. Bruch of Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of

Water Commissioners

the presence of

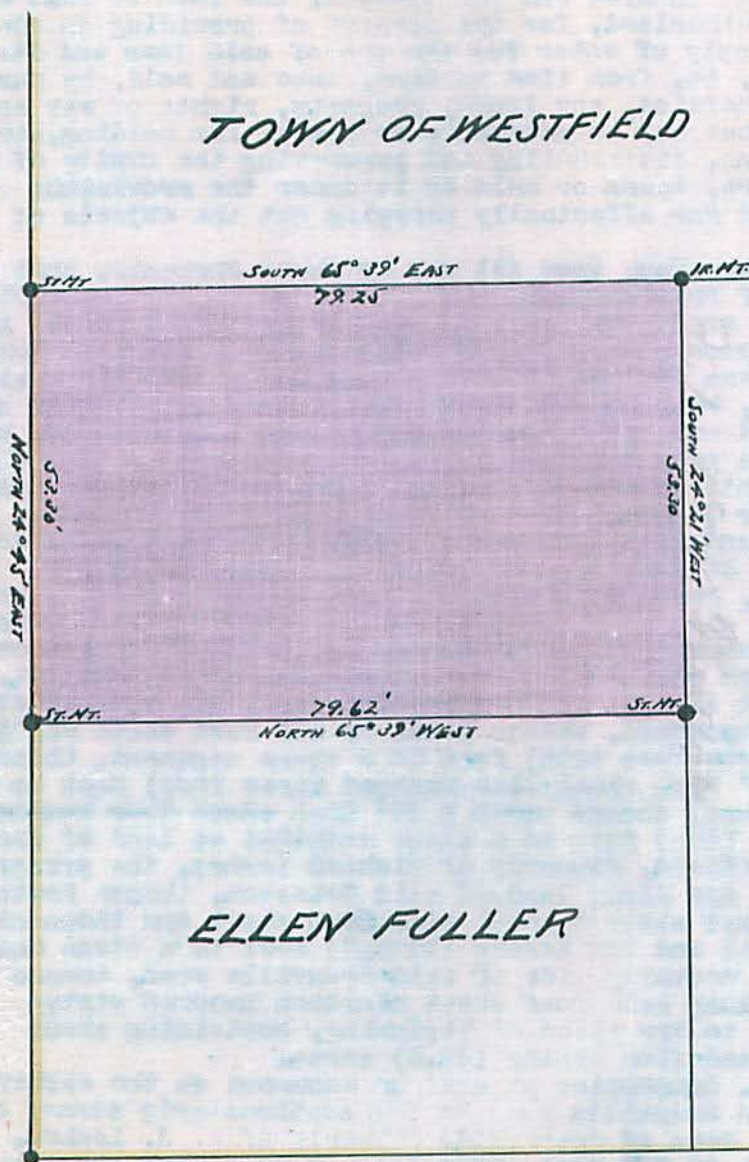
H. C. Lane 12237
Peter Jensen
 HAMPDEN COUNTY REGISTRY OF DEEDS
 RECEIVED AND RECORDED

JUL 9 1917

AT 9 OC. 20 M. 2 M

TOWN OF WESTFIELD

SACKETT STREET



ELLEN FULLER

ELLEN FULLER

DWIGHT STREET



WESTFIELD-WATER-WORKS
- MAP OF LAND TAKEN -
- ELIZA E. KELLOGG -
- SCALE 1 INCH = 20 FEET -
- JOHN L. HYDE - C. E. -
- 1917 -

Eliza E. Kellogg.

Whereas, by Chapter 342 of the Acts passed by the General Court of Massachusetts, in the year 1895, the Town of Westfield is authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, KNOW ALL MEN BY THESE PRESENTS, that the said Town of Westfield, by virtue of, and in part execution of the powers conferred by said Act, and for the purpose of holding, storing, and preserving the purity of such waters, and for effectually carrying out the provisions of said Act, is on this fourth day of September in the year 1917, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which in any way thereto appertain or belong.

Said land and property are bounded and described as follows:-
being owned by Eliza E. Kellogg, of said Westfield, and situated on Sackett Street, in said Westfield:-

Commencing at a stone monument in the easterly line of Sackett Street at the southwesterly corner of land of the Town of Westfield, thence South $65^{\circ}39'$ East along land of said Town seventy-nine and twenty-five one-hundredths (79.25) feet to an iron monument at land of Mrs. Ellen Fuller, thence North $24^{\circ}21'$ West along land of said Fuller fifty-three and three tenths (53.3) feet to a stone monument, thence North $39'$ West along land of said Fuller seventy-nine and sixty-two one-hundredths (79.62) feet to a stone monument in the easterly line of said Street, thence North $24^{\circ}45'$ East along said Street fifty-three and three tenths (53.3) feet to the place of beginning.

IN WITNESS WHEREOF the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Westfield.

N.C. Lane
Peter J. ...

BOARD OF
WATER
COMMISSIONERS

presence of:-

15954

HAMPDEN Co. REGISTRY OF DEEDS
RECEIVED AND RECORDED

SEP 24 1917

AT 10 00 45 M a M

Whereas, by Chapter 244 of the Acts passed by the General Court of Massachusetts in the year 1828, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said act, and for effectually carrying out the objects of said act:-

Now, Therefore, KNOW ALL MEN BY THESE PRESENTS, that the said Town of Westfield, by virtue of, and in pursuance of, the powers conferred by said act, and for the purpose of holding, storing, and preserving the purity of such waters, and for effectually carrying out the provisions of said act, has on this fourth day of September in the year 1897, taken, appropriated and now holds the land and property hereinafter described, together with any and all rights of way and easements which in any way thereto appertain or belong.

Said land and property are bounded and described as follows:-
Being owned by Eliza E. Kellogg, of said Westfield, and situated on Sakett Street, in said Westfield:-

Commencing at a stone monument in the easterly line of Sakett Street at the southeasterly corner of land of said Town of Westfield, thence South 88° 20' East along land of said Town seventy-nine and twenty-five one-hundredths (79.25) feet to an iron monument at land of Mrs. Ellen Miller, thence South 88° 21' West along land of said Miller fifty-three and three tenths (53.3) feet to a stone monument, thence South 88° 20' West along land of said Miller seventy-nine and sixty-two one-hundredths (79.62) feet to a stone monument in the easterly line of said Street, thence North 88° 20' East along said Street fifty-three and three tenths (53.3) feet to the place of beginning.

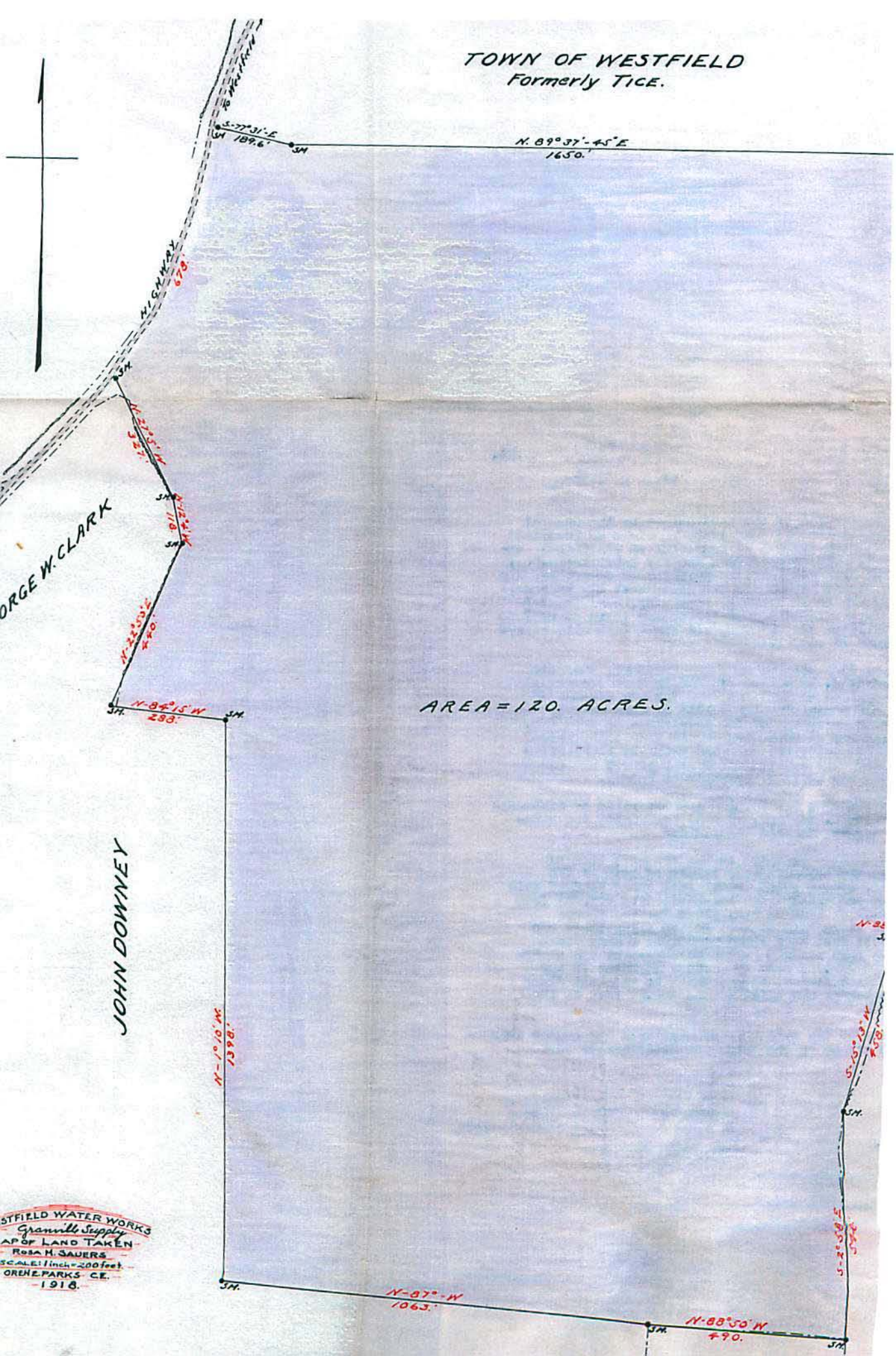
IN WITNESS WHEREOF the said Town of Westfield has caused this instrument to be signed by its authorized officers and its seal to be hereunto set.

137674
Eliza E. Kellogg
to
Inhabitants of
Westfield

RECEIVED AND RECORDED
SEP 24 1897
AT 10 00 45 M A

Presence of:-

TOWN OF WESTFIELD
Formerly TICE.



Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts, in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters, taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know All Men By These Presents, that said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this seventh day of December, in the year of nineteen hundred eighteen, taken, appropriated and now holds the land and property hereinafter described together with any and all rights of way and easements which, in anywise thereto appertain or belong.

Said lands and property are situated in Granville in said County of Hampden, and are described as follows:-

Commencing at a stone monument on the Easterly side of the highway at land of Town of Westfield, formerly of Dustin Tice; thence South $77^{\circ} 31'$ East, about one hundred eighty-nine and six-tenths (189.6) feet to a stone monument; thence North $89^{\circ} 37' 45''$ East, about sixteen hundred fifty (1650) feet to a stone monument; thence South $2^{\circ} 36' 30''$ East about eight hundred seventy and nine-tenths (870.9) feet to a marked eighteen inch Yellow Birch tree; thence South $4^{\circ} 08' 30''$ West about ten hundred fifty-two and nine-tenths (1052.9) feet to a stone monument at land of Seymour, the last four courses being along said land of Town of Westfield formerly of said Tice; thence North $88^{\circ} 16' 45''$ West about eighty-five (85) feet to a stone monument; thence South $15^{\circ} 13'$ West about four hundred fifty-eight (458) feet to a stone monument; thence South $2^{\circ} 58'$ East about five hundred forty (540) feet to a stone monument; thence North $88^{\circ} 50'$ West about four hundred ninety (490) feet to a stone monument at land of John Dugano, the last four courses being along land of said Seymour; thence North $87^{\circ} 00'$ West about ten hundred sixty-three (1063) feet along land of said Dugano to a stone monument at land of John Downey; thence North $1^{\circ} 10'$ West about thirteen hundred ninety-eight (1398) feet to a stone monument; thence North $84^{\circ} 15'$ West about two hundred eighty-eight (288) feet to a stone monument at land of George W. Clark, the last two courses being along land of said Downey; thence North $22^{\circ} 50'$ East about four hundred forty (440) feet to a stone monument; thence North $12^{\circ} 04'$ West about one hundred eighteen (118) feet to a stone monument; thence North $27^{\circ} 05'$ West about three hundred twenty-seven (327) feet to a stone monument on the easterly side of said highway, the last three courses being along land of said Clark; thence along said highway about six hundred seventy-eight (678) feet to place of beginning; containing about one hundred twenty (120) acres.

The foregoing described tract is supposed to belong to Rosa M. Sauers and others, now or formerly of Granville.

In Witness Whereof, the said Town of Westfield has caused this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners

(N.C. Lane.
(Peter Jensen
(Edward G. Clark.

In the presence of

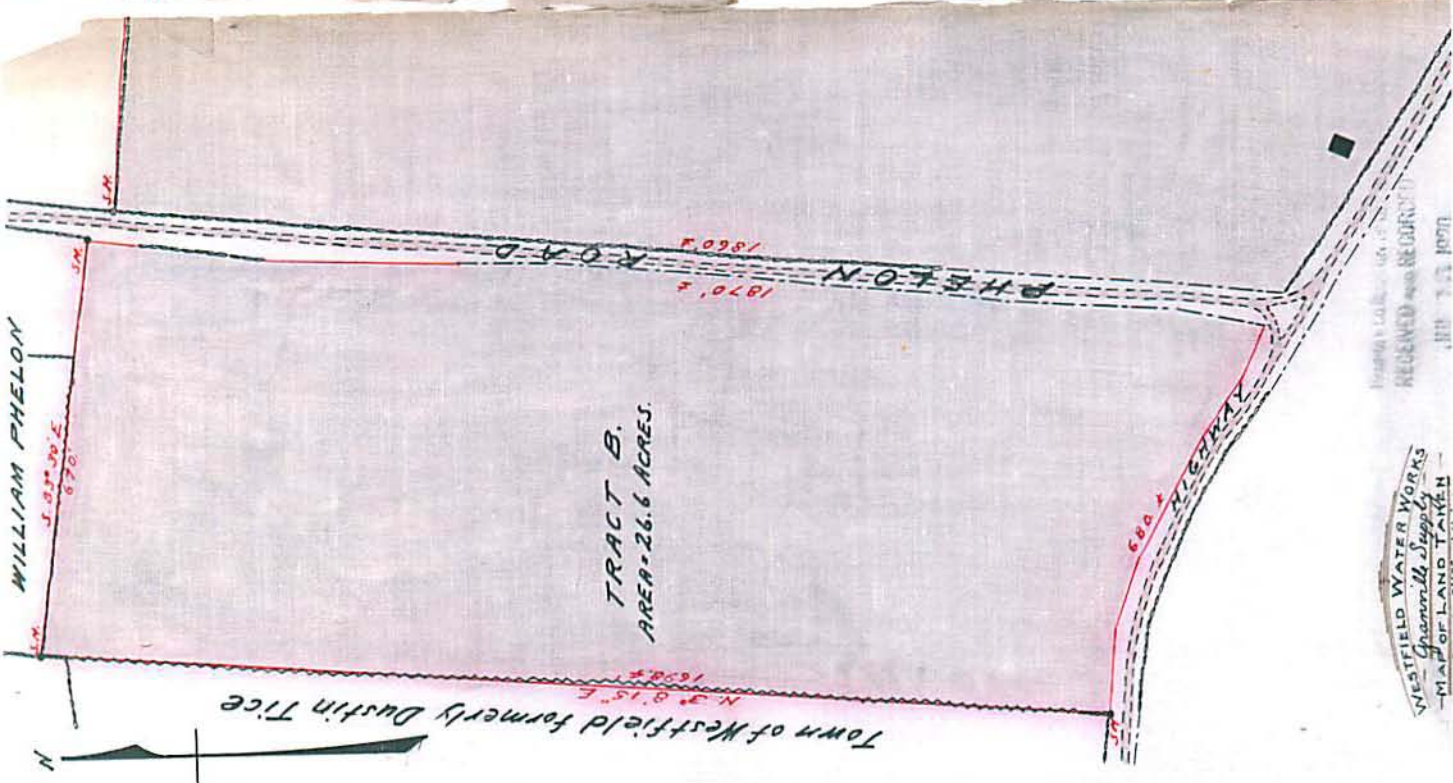
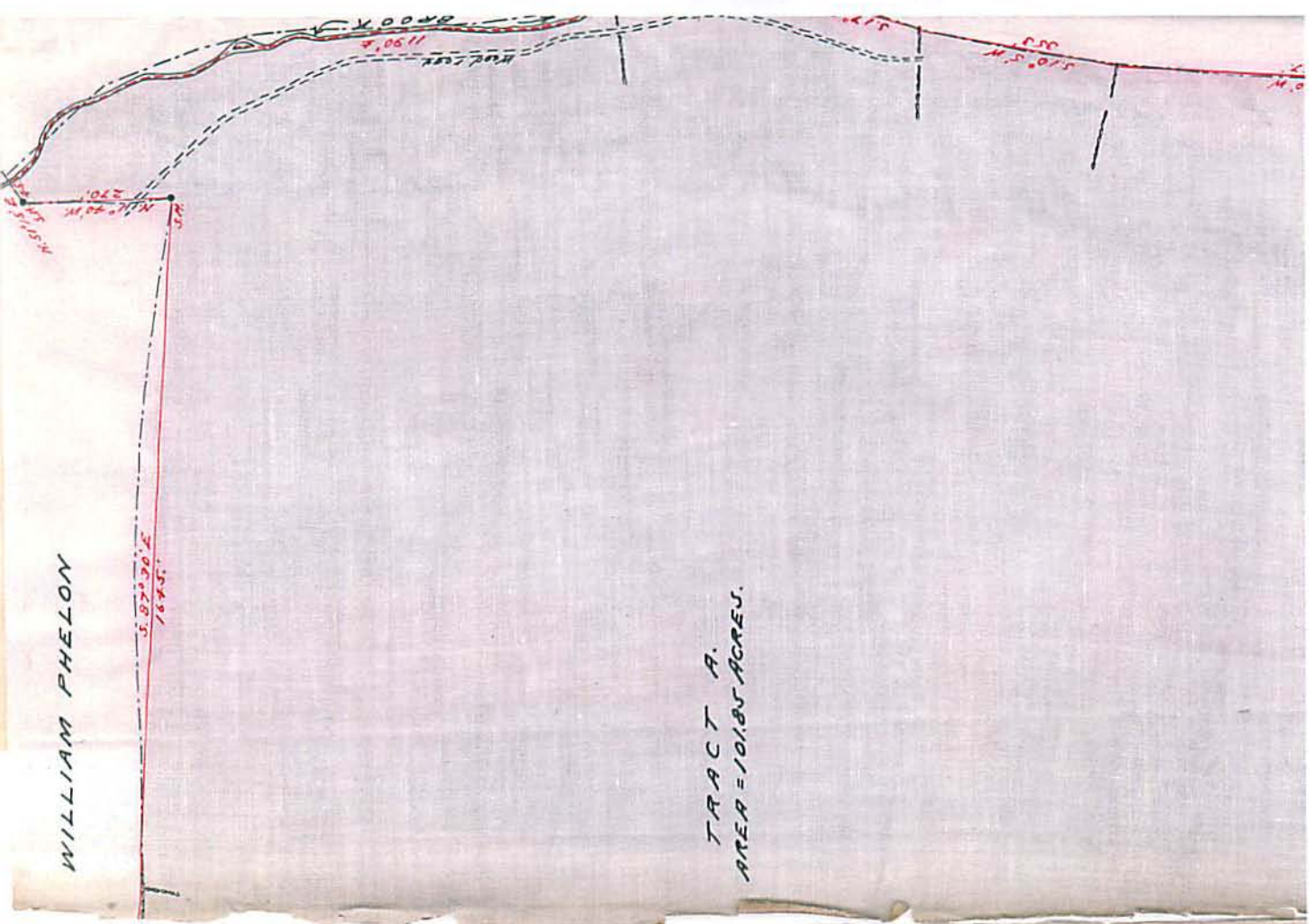
Amos E. Fink

2695

APPROVED AND
RECORDED

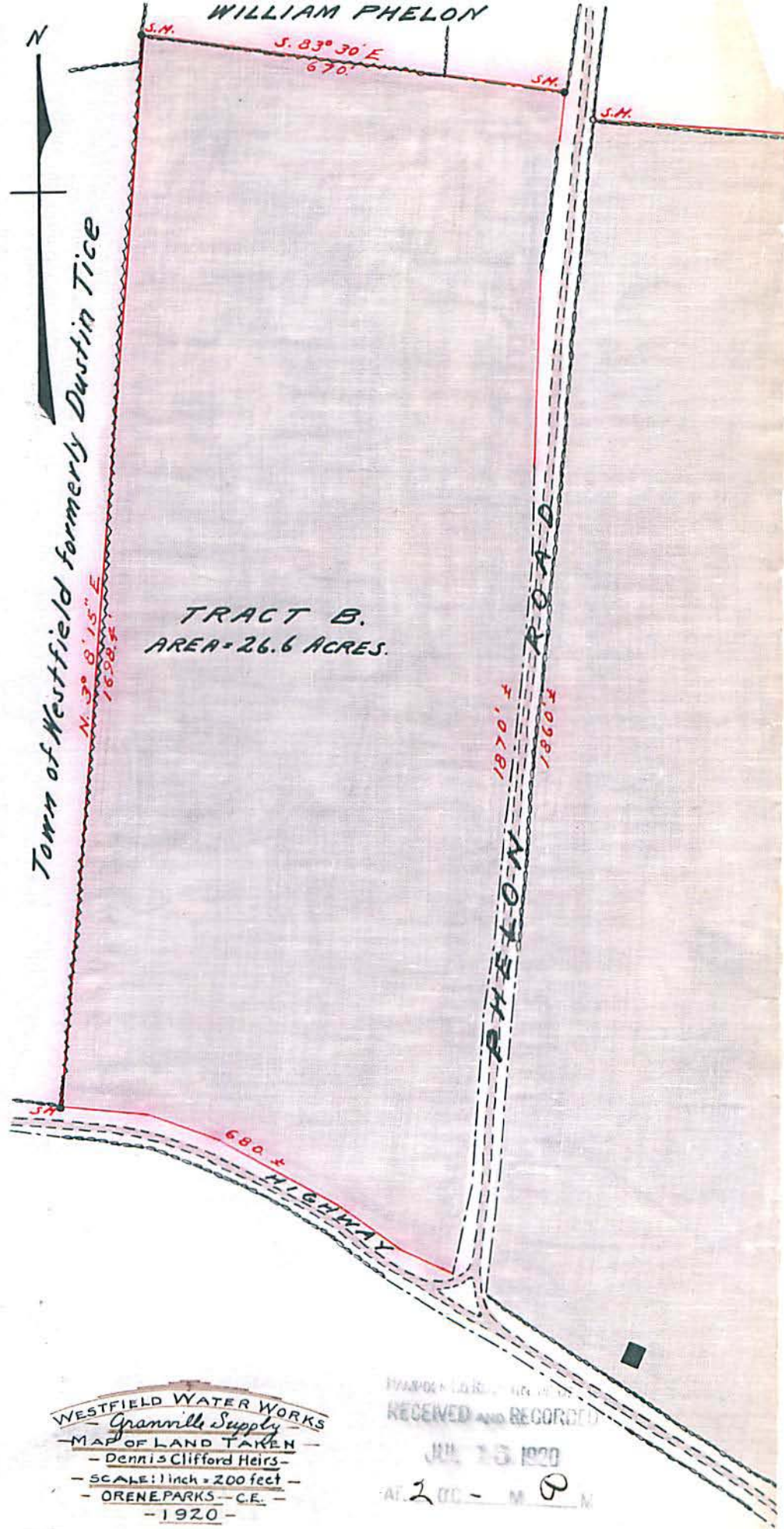
MAR 7 1919

AT 3 O'CLOCK P.M.



WESTFIELD WATER WORKS
Channel Supply
MAP OF LAND TAKEN

RECEIVED
JUN 10 1907



Clifford

Whereas, by Chapter three hundred and forty-two of the Acts passed by the General Court of Massachusetts, in the year eighteen hundred and ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters, taken or held by it under the provisions of said Act, and for effectually carrying out the objects of said Act:-

Now, Therefore, Know All Men By These Presents, that said Town of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters and for effectually carrying out the provisions of said Act, has, on this 1st day of July, in the year of nineteen hundred twenty, taken, appropriated and now holds the land and property hereinafter described together with any and all rights of way and easements which, in anywise thereto appertain or belong.

Said lands and property are situated in the East Parish of Granville, in said County of Hampden, and are described as follows:-

Tract A. Commencing at a stone monument on the northerly side of the highway a little easterly of the homestead of Dennis Clifford, at land of Town of Westfield, formerly of Wilbur Pendleton; thence westerly along said highway about twenty-one hundred (2100) feet to Phelon Road, so-called; thence northerly along said road about eighteen hundred sixty (1860) feet to a stone monument at land of William Phelon; thence South $87^{\circ} 30'$ East about sixteen hundred forty-five (1645) feet to a stone monument; thence North $1^{\circ} 40'$ West about two hundred seventy (270) feet to a stone monument; thence North $51^{\circ} 45'$ East about forty-five (45) feet to the center of a brook at land of Town of Westfield, formerly of said Wilbur Pendleton, the last three courses being along land of said William Phelon; thence southerly along said brook about eleven hundred ninety (1190) feet; thence South $7^{\circ} 23'$ East about two hundred forty (240) feet to a stone monument; thence South $17^{\circ} 44'$ West about three hundred four (304) feet; thence South $10^{\circ} 05'$ West about three hundred fifty-three (353) feet; thence South $3^{\circ} 30'$ West about five hundred sixty-seven (567) feet to place of beginning, the last five courses being along land of Town of Westfield, formerly of said Wilbur Pendleton. Described tract contains about one hundred one and eighty-five one-hundredths (101.85) acres.

Tract B. Commencing at a stone monument on the northerly side of the highway at land of Town of Westfield, formerly of Justin Tice; thence North $3^{\circ} 08' 15''$ East along land formerly of said Justin Tice about sixteen hundred ninety-eight and four tenths (1698.4) feet to a stone monument at land of William Phelon; thence South $83^{\circ} 30'$ East along land of said William Phelon about six hundred seventy (670) feet to a stone monument on the westerly side of Phelon Road, so called; thence southerly along said road about eighteen hundred seventy (1870) feet to the first mentioned highway; thence westerly along said highway about six hundred eighty (680) feet to place of beginning; containing about twenty-six and six-tenths (26.6) acres.

The foregoing described tract is supposed to belong the Estate of Dennis Clifford, late of Westfield, formerly of Granville.

In Witness Whereof, the said Town of Westfield has used this instrument to be signed by the Water Commissioners of said Town.

Board of
Water Commissioners

(A. C. Lane)
(Peter Jensen)
(Edward C. Black)

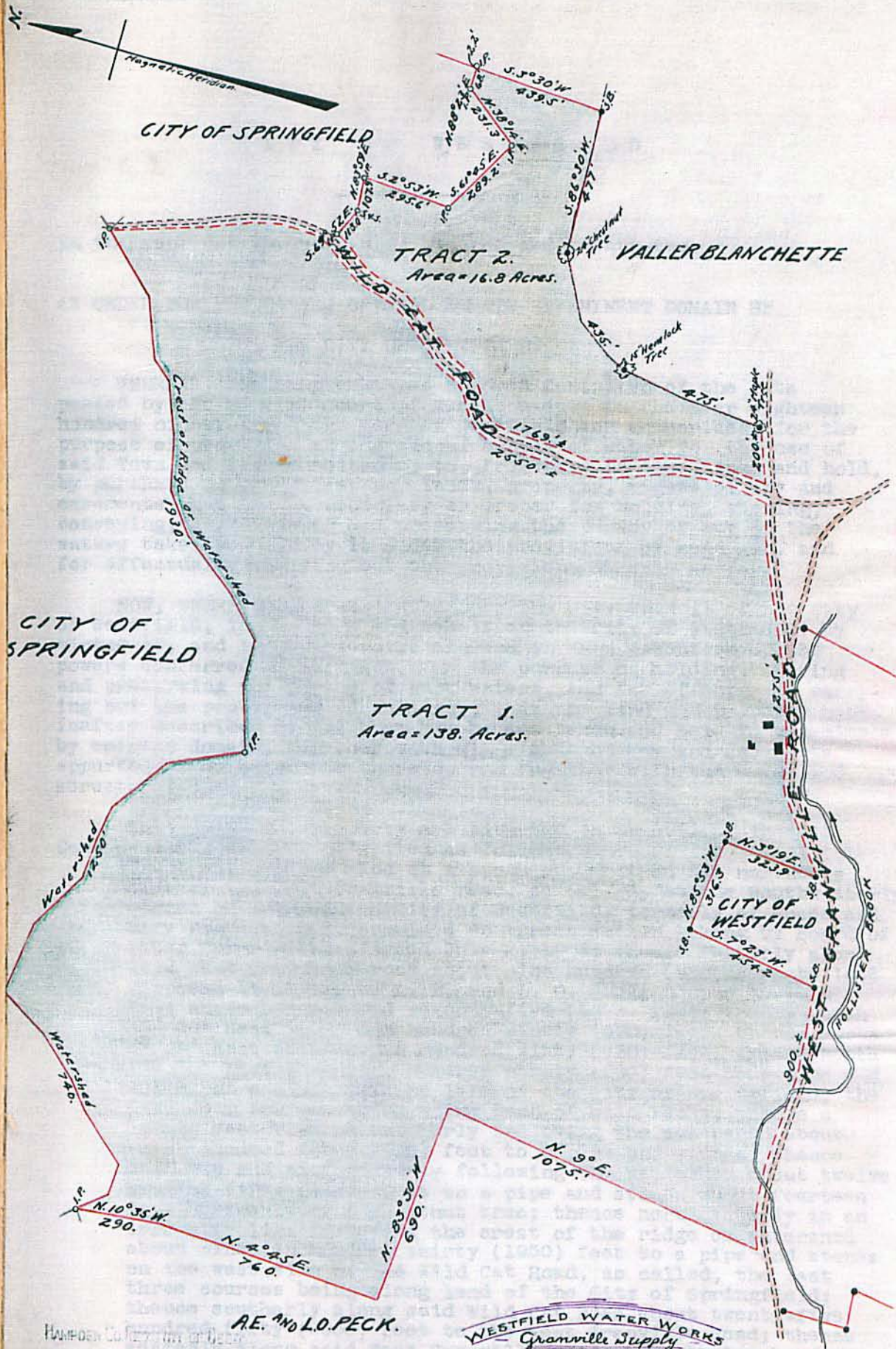
presence of Orin E. Parks

16294

HAMPDEN Co. REGISTRY OF DEEDS
RECEIVED AND RECORDED

JUL 15 1920

AT 2 OC - M. P. M.



HAMPSHIRE COUNTY OFFICE OF RECORDS
RECEIVED AND RECORDED
FEB 10 1922
AT 11:05 AM

A.E. AND L.O. PECK.

WESTFIELD WATER WORKS
- Granville Supply
- MAP OF LAND TAKEN
- J. G. CAREW
- SCALE: 1 inch = 400 feet.
- A. L. PEABODY - Engr. -
- 1922 -

CITY OF WESTFIELD

In the year one thousand nine hundred and twenty-two.

AN ORDER FOR THE TAKING OF REAL ESTATE BY EMINENT DOMAIN BY

THE CITY OF WESTFIELD.

WHEREAS, By chapter three hundred forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the provisions of said Act:-

NOW, THEREFORE, IT IS ORDERED by the City Council of the City of Westfield, in the name and behalf of the City of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing and preserving the purity of such waters, and for effectually carrying out the provisions of said Act, that the land and property hereinafter described be and they hereby are taken and held in fee-simple, by eminent domain, together with all rights of way and easements appurtenant or belonging thereto, and together with the trees and structures thereon.

Said lands and property are situated in Granville, in said Commonwealth, and are described as follows:-

Tract #1. Commencing at a stone monument on the northerly side of the West Granville road, so called, at the southwesterly corner of land of the City of Westfield, formerly of Moses and Mary Provost, and described as "Tract #2" in taking by Board of Water Commissioners dated July 2, 1906; thence westerly along said West Granville road about nine hundred (900) feet to land supposed to belong to A. E. and L. O. Peck; thence North 90° East about ten hundred seventy-five (1075) feet; thence North 83° 30' West about six hundred ninety (690) feet; thence North 40° 45' East about seven hundred sixty (760) feet; thence North 10° 35' West about two hundred ninety (290) feet to a pipe and stones at a wire fence at land of the City of Springfield; the last four courses being along land of said Pecks; thence a little easterly and northerly following the watershed about seven hundred forty (740) feet to a pipe and stones; thence easterly and southeasterly following the watershed about twelve hundred fifty (1250) feet to a pipe and stones about fourteen feet northerly of a Chestnut tree; thence northeasterly in an irregular line following the crest of the ridge or watershed about nineteen hundred thirty (1930) feet to a pipe and stones on the west side of the Wild Cat Road, so called, the last three courses being along land of the City of Springfield; thence southerly along said Wild Cat road about twenty-five hundred fifty (2550) feet to the West Granville Road; thence westerly along said West Granville road about twelve hundred seventy-five (1275) feet to a stone monument at land of the City of Westfield, formerly of one Provost; thence North 30°

19' East about three hundred twenty-three and nine tenths (323.9) feet to a stone monument; thence North $85^{\circ} 53'$ West about three hundred sixteen and three tenths (316.3) feet to a stone monument; thence South $7^{\circ} 23'$ West about four hundred fifty-four and two tenths (454.2) feet to place of beginning, the last three courses being along land of the City of Westfield, formerly of Moses and Mary Provost. The aforescribed tract contains about one hundred thirty-eight (138) acres.

Tract #2. Commencing at an iron pipe and stones on the easterly side of the Wild Cat road at land of the City of Springfield; thence South $69^{\circ} 52'$ East about one hundred thirteen (113) feet to a stake and stones; thence North $83^{\circ} 59'$ East about one hundred seven and nine tenths (107.9) feet to an iron pipe and stones; thence South $2^{\circ} 53'$ West about two hundred ninety-five and six tenths (295.6) feet to an iron pipe and stones; thence South $61^{\circ} 45'$ East about two hundred eighty nine and two tenths (289.2) feet to an iron pipe and stones; thence North $38^{\circ} 14'$ East about two hundred thirty-one and three tenths (231.3) feet to an iron pipe and stones; thence North $88^{\circ} 23'$ East about sixty-eight (68) feet to a point bearing South $88^{\circ} 23'$ West two and two tenths (2.2) feet from an iron pipe and stones; thence South $3^{\circ} 30'$ West about four hundred thirty-nine and five tenths (439.5) feet to a stone monument at land supposed to belong to Valler Blanchette; the preceeding courses being along land of said City of Springfield; thence South $86^{\circ} 30'$ West about four hundred seventy-seven (477) feet to a twenty-four (24) inch Chestnut tree; thence southwesterly along a fence about four hundred thirty-five (435) feet to a fifteen (15) inch Hemlock tree; thence southerly along a fence about four hundred seventy-five (475) feet to a twenty-four (24) inch Maple tree on the northerly side of an old highway, the last three courses being along land of said Blanchette; thence westerly along said old highway about two hundred (200) feet to a point on the easterly side of the Wild Cat road, thence northerly along said Wild Cat road about seventeen hundred sixty-nine (1769) feet to place of beginning, containing about sixteen and eight tenths (16.8) acres.

The foregoing described tracts are supposed to belong to Justin G. Carew of Monson, Mass.

PRESENTED TO THE MAYOR

FOR APPROVAL February 4th, 1922,

Florence W. Burke,
City Clerk


APPROVED BY THE MAYOR

February 4th, 1922,

Geo. W. Searle,
Mayor

The foregoing is a true copy of an order unanimously passed through all its stages of legislation under suspension of the rules by the City Council of the City of Westfield, Massachusetts, on the 2nd day of February, 1922, and of the indorsement of the City Clerk and the approval of the Mayor thereon.

ATTEST:


Florence W. Burke
City Clerk

2545

HAMPDEN CO. REGISTRY OF DEEDS
RECEIVED AND RECORDED

FEB 10 1922

AT 1 05 P M

7835

CITY OF WESTFIELD

HANDREN COUNTY OF DEEDS
RECEIVED AND RECORDED

APR 25 1922

AT 3 OC 35 M P M

In the year one thousand nine hundred and twenty-two.

AN ORDER FOR THE TAKING OF REAL ESTATE BY EMINENT DOMAIN BY
THE CITY OF WESTFIELD.

WHEREAS, By chapter three hundred forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the provisions of said Act:-

NOW, THEREFORE, IT IS ORDERED by the City Council of the City of Westfield, in the name and behalf of the City of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing, and preserving the purity of such waters, and for effectually carrying out the provisions of said Act, that the land and property hereinafter described be and they hereby are taken and held in fee-simple, by eminent domain, together with all rights of way and easements appurtenant or belonging thereto, and together with the trees and structures thereon.

Said lands and property are situated in Granville, in said Commonwealth and are described as follows:-

Commencing at a point on the northerly side of the West Granville Road, so called, at land of the City of Westfield, formerly of J. G. Carew; thence westerly along said road about thirteen hundred seventy-five (1375) feet to a stone monument at land supposed to belong to M. E. Arnold; thence North 50° 40' East about sixteen hundred sixty-five (1665) feet to a stone monument; thence South 89° 30' West about one hundred ninety (190) feet to a stone monument; thence North 70° 50' East about ten hundred eighty-five (1085) feet to an iron monument at land of the City of Springfield, the last three courses are along land supposed to belong to said Arnold; thence easterly along land of said City of Springfield about six hundred sixty (660) feet to an iron monument at land of the City of Westfield, formerly of said J. G. Carew; thence South 10° 35' East about two hundred ninety (290) feet; thence South 40° 45' West about seven hundred sixty (760) feet; thence South 83° 30' East about six hundred ninety (690) feet; thence South 90° 00' West about ten hundred seventy-five (1075) feet to place of beginning, the last four courses are along land of the City of Westfield, formerly of J. G. Carew. The afore described tract of land contains about 60.9 acres and is supposed to belong to A. E. and L. O. Peck.

Westfield, Massachusetts, April 21, 1922.

The foregoing is a true copy of an order passed through all its stages of legislation by unanimous consent under suspension of the rules by the City Council of the City of Westfield, Mass., April 10, 1922, and of the indorsement of the City Clerk and approval of the Mayor thereon.

Attest: Florence W. Burke City Clerk.

For approval... April 20 1922

Florence W. Burke

George W. Searle

City Clerk

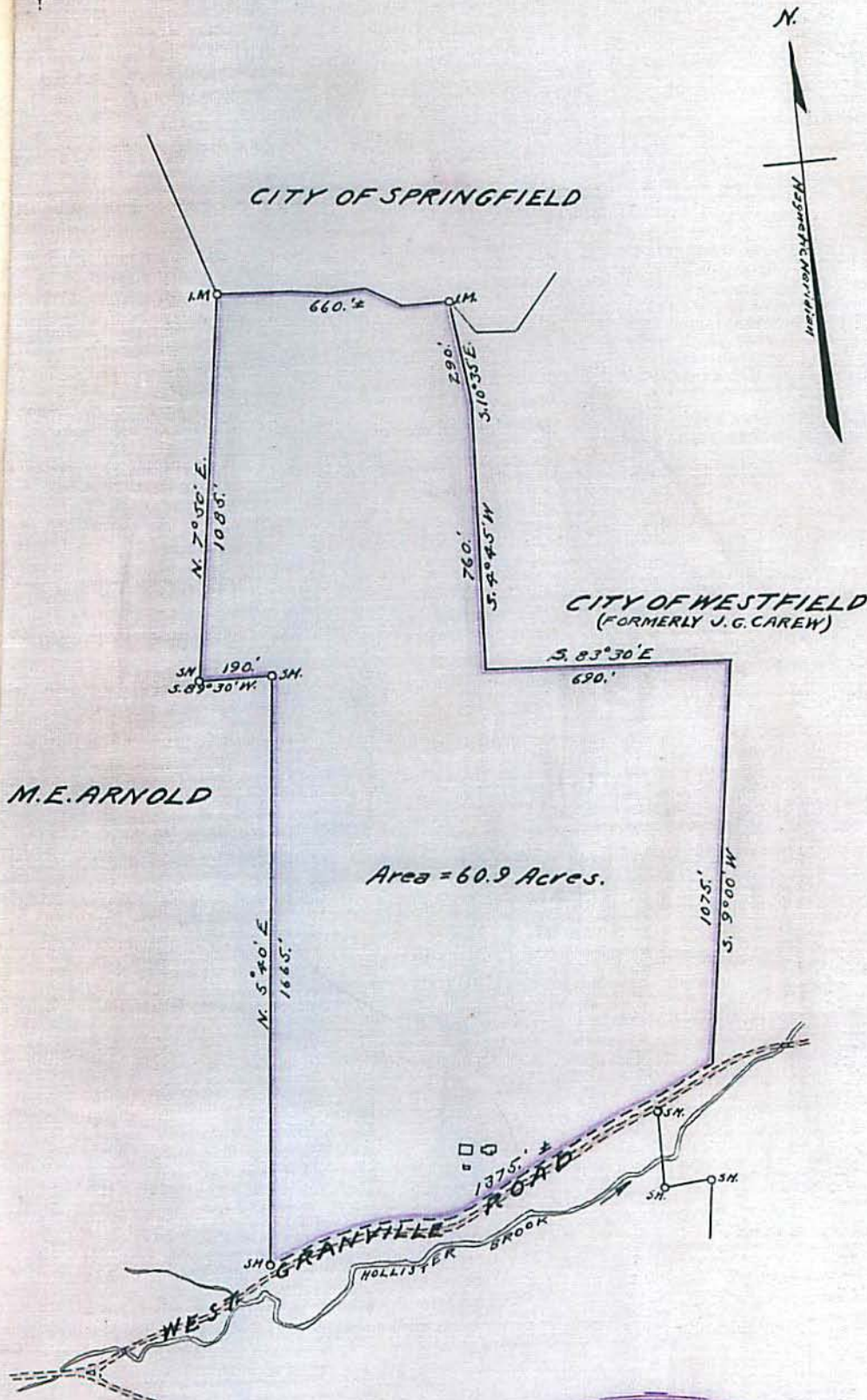
Presented to the Mayor
APPROVED BY THE MAYOR

DEL US
DED

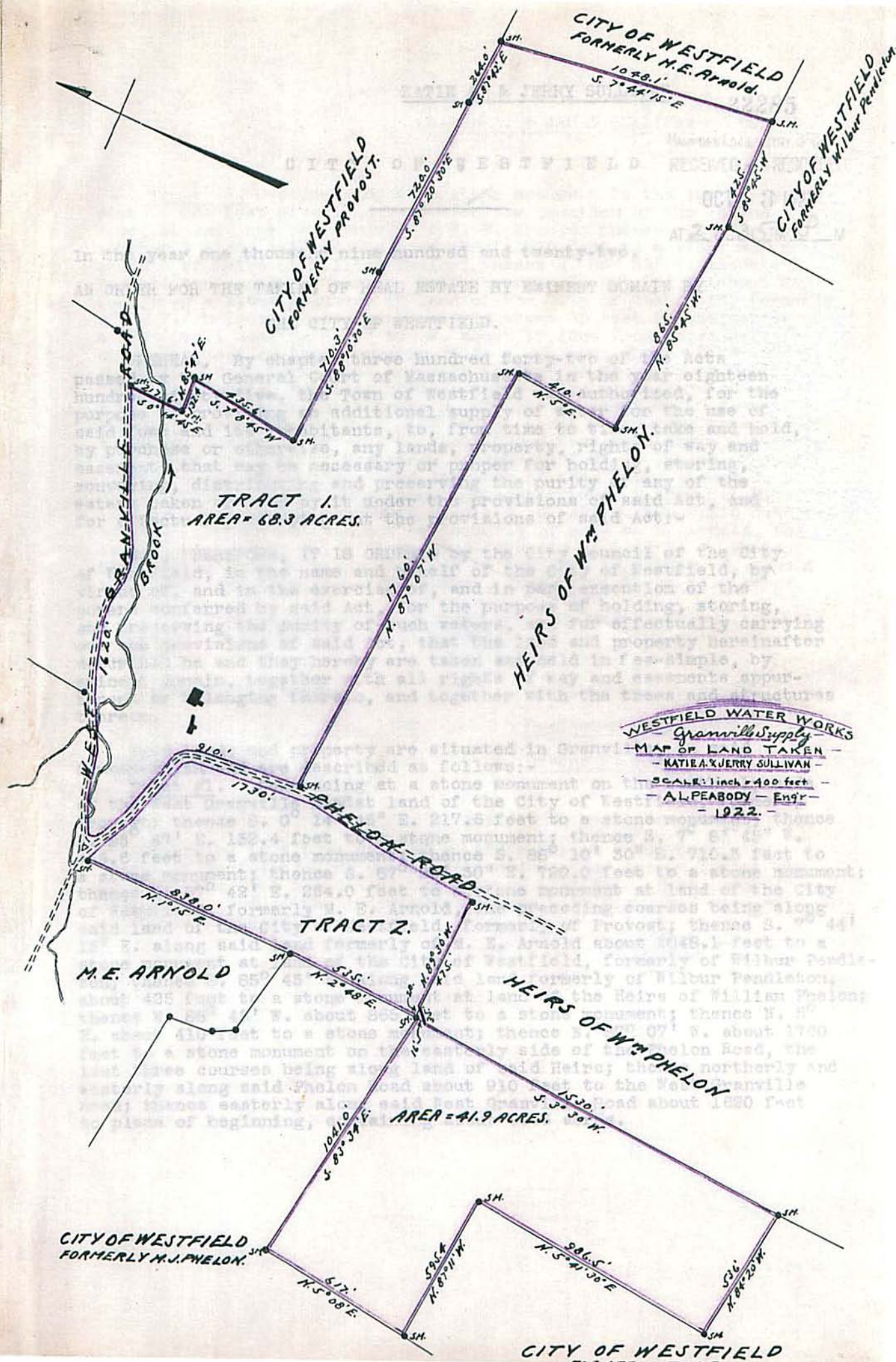
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7.

2.



WESTFIELD WATER WORKS
- Granville Supply -
- MAP OF LAND TAKEN -
- A.E. & L.O. PECK -
- SCALE: 1 inch = 400 feet -
- A.L. PEABODY - Engr -
- 1922 -



CITY OF WESTFIELD

MASSACHUSETTS DEPARTMENT OF LANDS
RECEIVED AND RECORDED

OCT 3 1922

AT 2 OC 35 M P M

In the year one thousand nine hundred and twenty-two.

AN ORDER FOR THE TAKING OF REAL ESTATE BY EMINENT DOMAIN BY
THE CITY OF WESTFIELD.

WHEREAS, By chapter three hundred forty-two of the Acts passed by the General Court of Massachusetts in the year eighteen hundred ninety-five, the Town of Westfield was authorized, for the purpose of providing an additional supply of water for the use of said Town and its inhabitants, to, from time to time, take and hold, by purchase or otherwise, any lands, property, rights of way and easements that may be necessary or proper for holding, storing, conveying, distributing and preserving the purity of any of the waters taken or held by it under the provisions of said Act, and for effectually carrying out the provisions of said Act:-

NOW, THEREFORE, IT IS ORDERED by the City Council of the City of Westfield, in the name and behalf of the City of Westfield, by virtue of, and in the exercise of, and in part execution of the powers conferred by said Act, for the purpose of holding, storing, and preserving the purity of such waters, and for effectually carrying out the provisions of said Act, that the land and property hereinafter described be and they hereby are taken and held in fee-simple, by eminent domain, together with all rights of way and easements appurtenant or belonging thereto, and together with the trees and structures thereon.

Said lands and property are situated in Granville, in said Commonwealth and are described as follows:-

Tract #1. Commencing at a stone monument on the southerly side of the West Granville Road at land of the City of Westfield, formerly Provost; thence S. $0^{\circ} 14' 45''$ E. 217.6 feet to a stone monument; thence N. $85^{\circ} 47'$ E. 132.4 feet to a stone monument; thence S. $7^{\circ} 8' 45''$ W. 435.6 feet to a stone monument; thence S. $88^{\circ} 10' 30''$ E. 710.3 feet to a stone monument; thence S. $87^{\circ} 20' 30''$ E. 720.0 feet to a stone monument; thence S. $87^{\circ} 42'$ E. 264.0 feet to a stone monument at land of the City of Westfield, formerly M. E. Arnold, the preceding courses being along said land of the City of Westfield, formerly of Provost; thence S. $7^{\circ} 44' 15''$ E. along said land formerly of M. E. Arnold about 1048.1 feet to a stone monument at land of the City of Westfield, formerly of Wilbur Pendleton; thence S. $85^{\circ} 45'$ W. along said land formerly of Wilbur Pendleton, about 425 feet to a stone monument at land of the Heirs of William Phelon; thence N. $85^{\circ} 45'$ W. about 865 feet to a stone monument; thence N. 5° E. about 410 feet to a stone monument; thence N. $87^{\circ} 07'$ W. about 1760 feet to a stone monument on the easterly side of the Phelon Road, the last three courses being along land of said Heirs; thence northerly and westerly along said Phelon Road about 910 feet to the West Granville Road; thence easterly along said West Granville Road about 1620 feet to place of beginning, containing about 68.3 acres.

Tract #2. Commencing at a stone monument on the southerly side of the West Granville Road near the junction of the Phelon Road, at land now or formerly of M. E. Arnold; thence easterly and southerly along said Phelon Road about 1730 feet to a stone monument at land of Heirs of William Phelon; thence N. $89^{\circ} 30'$ W. about 475 feet to the corner of a stone wall, bearing S. $89^{\circ} 30'$ E. about 20 feet from a stone monument at land of the City of Westfield, formerly of M. J. Phelon; thence southwesterly about 35 feet to the corner of a stone wall bearing S. $3^{\circ} 30'$ W. about 16 feet from above described stone monument at land formerly of M. J. Phelon; thence S. $3^{\circ} 30'$ W. about 1530 feet to a stone monument at land of the City of Westfield, formerly of Tice, the last three courses being along land of said Heirs of William Phelon; thence N. $84^{\circ} 20'$ W. about 536.0 feet to a stone monument; thence N. $5^{\circ} 41' 30''$ E. about 986.5 feet to a stone monument; thence N. $87^{\circ} 11'$ W. about 595.4 feet to a stone monument at land of the City of Westfield, formerly of M. J. Phelon, the last three courses being along land formerly of said Tice; thence N. $5^{\circ} 08'$ E. about 617 feet to a stone monument; thence S. $83^{\circ} 34'$ E. about 1041 feet to a stone monument; thence N. $2^{\circ} 48'$ E. about 535 feet to a stone monument at land now or formerly of said M. E. Arnold, the last three courses being along land formerly of said M. J. Phelon; thence N. $1^{\circ} 15'$ E. along land now or formerly of said M. E. Arnold about 838 feet to place of beginning, containing about 41.9 acres.

The foregoing described tracts are supposed to belong to Katie A. & Jerry Sullivan of Granville, Mass.

Presented to the Mayor

Approved by the Mayor

For approval Sept. 25th, 1922.

September 25th, 1922

Harold Whittemore,
City Clerk

George W. Searle,
Mayor

Westfield, Mass., Sept. 25, 1922.

The foregoing is a true copy of an order passed through all its stages of legislation by unanimous consent under suspension of the rules by the City Council of the City of Westfield, Mass., Sept. 21st, 1922, and of the indorsement of the City Clerk and approval of the Mayor thereon.

Attest:

Harold Whittemore
City Clerk.

Westfield Water Works - 1874



1874 Reports

Description of Lands Taken and Location Maps for Westfield Water Works - 1874 - by the Town of Westfield by Act of Massachusetts Legislature approved May 29, 1873. See: Hampden County Registry of Deeds Book 308, Page 346 for description of tracings.

City/Town	Westfield
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City/Town	Montgomery
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Name	Atwater
------	---------

Name	Horton, Samuel
------	----------------

Name	Moore, Octerlony
------	------------------

Name	Moore, Oliver A
------	-----------------

Name	Moore, Horace F
------	-----------------

Name	Williams, Frances E
------	---------------------

Name	Thompson, David
------	-----------------

Name	Phelan, Elisha
------	----------------

Name	Deneen, Jere
------	--------------

Name	Hines, Patrick
------	----------------

Name	Mallory
------	---------

Name	Simmons
------	---------

Name	Dibble, John
------	--------------

Name	Perry, David
------	--------------

Name	Collins, Erastus
------	------------------

Name	Atkins, Martin
------	----------------

Name	Atkins, Dennis
Name	Yeamans
Name	Phelan, John
Name	Cooley, Charles
Name	Moseley, David
Name	Massachusetts Comm
Name	Bancroft, Edward
Railroads	New Haven & Northampton Railroad
Railroads	Boston & Albany Railroad
Streets	North Elm Street
Streets	Pochassic Road
Water	Westfield River

DESCRIPTION OF LANDS TAKEN
AND LOCATION MAPS.

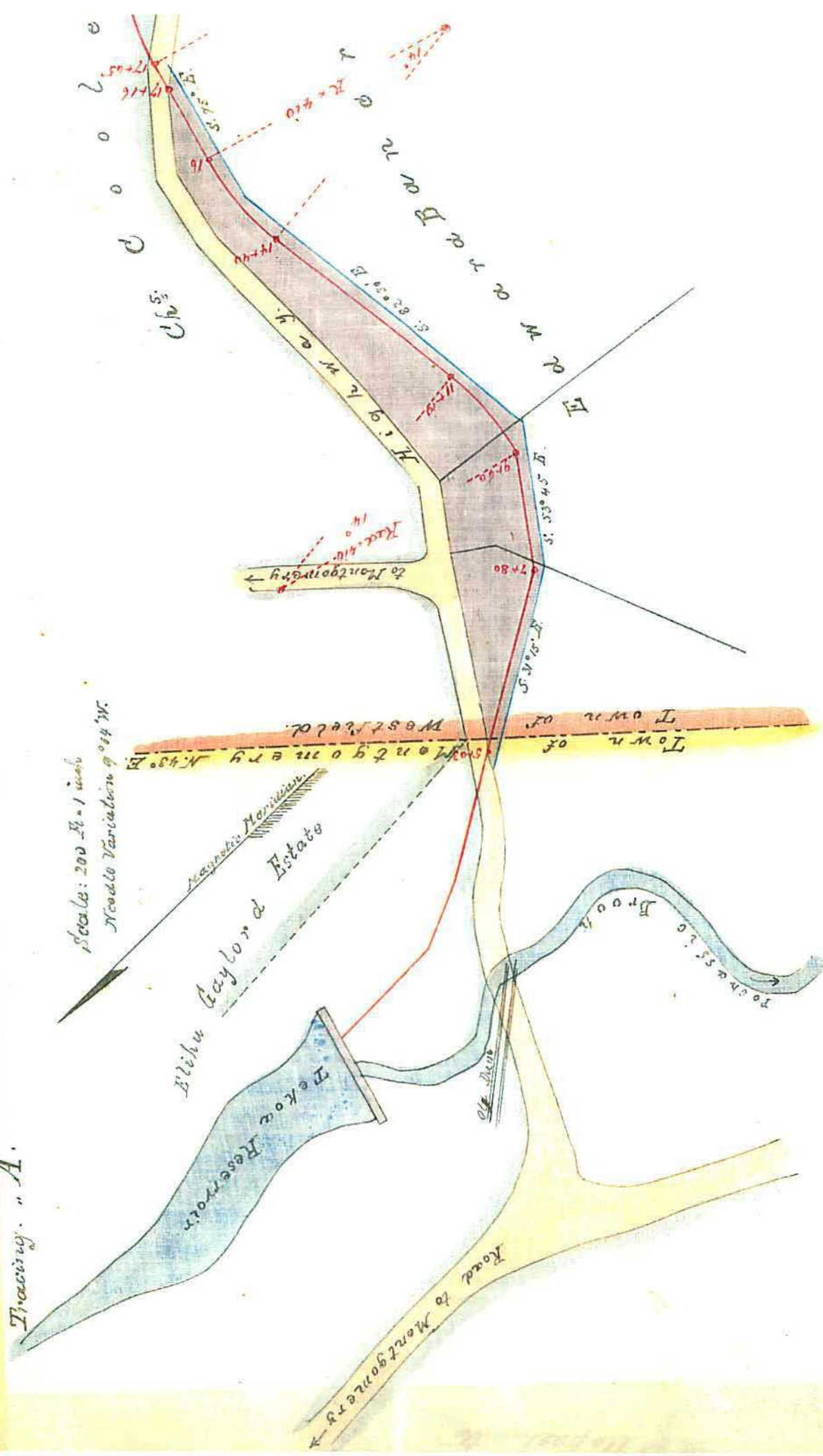
WESTFIELD WATER WORKS.

1874.

Commonwealth of Massachusetts
Hampden Co.

Received July 18th 1874 and filed with Hampden County
Deeds By James E. Russell Register

Scale: 200 ft = 1 inch
Needle Variation $9^{\circ} 14' W.$



Description of Land

The Town of Westfield in accordance with the authority given by an act of the Legislature of Massachusetts intitled an act to supply the Town of Westfield with pure water approved May 29 1873. and for the purpose named in 1st and 3^d Section of said act, have taken and do hereby take the following described lands situated in Montgomery and Westfield Hampden County Massachusetts and supposed to belong to

Edward Bancroft

Commencing at a Stake and Stone about 50 feet westerly of Town line between Montgomery and Westfield and in line between Edward Bancroft and the southerly line of old road and running $S 31^{\circ} 15' E$ 310 feet to Stake and Stone in old stone wall, thence $S 82^{\circ} 30' E$ 520 feet to Stake and Stone, thence $S 75^{\circ} E$ 230 feet to Stake and Stone in fence on southerly side of highway. The above description is for southerly line of Lands taken and said lands taken include all the land lying northerly between the above described line and the highway, containing two acres and eighteen rods (2 acres 18 rods) more or less.

Also a strip of land across the Highway from last described point $S 75^{\circ} E$ 54 feet to a Stake and Stone in the northerly line of said Highway. The width of land taken being one rod on each side of above described line containing 7 rods more or less.

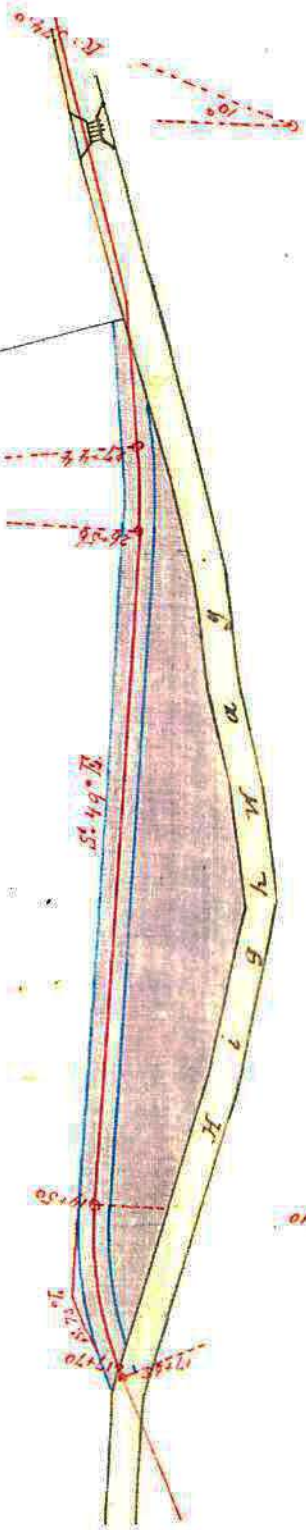
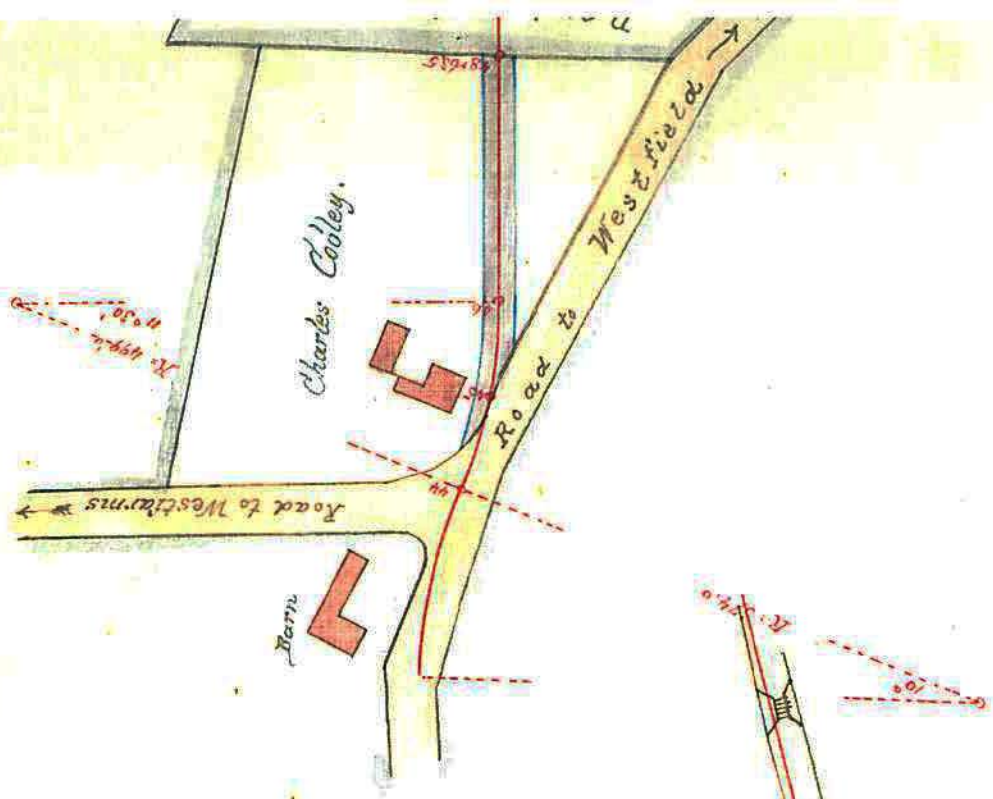
The tracing marked A hereto annexed is hereby made a part of this description,

ing. B.

Needle Variation = $9^{\circ}04'W$.
Scale: 200 ft = 1 inch

Magnetic Meridian.

Charles Cooley



R. 49.4
R. 50.1
R. 59.85

Also one certain tract or parcel of land situated in Westfield in said County supposed to belong to Charles Cooley and described as follows.

Commencing at a Stake and Stone on the northerly side of highway and running $S. 75^{\circ} E. 110$ feet, Thence $S. 49^{\circ} E. 1000$ feet to a Stake and Stone on northerly line of said Highway and at corner of lot.

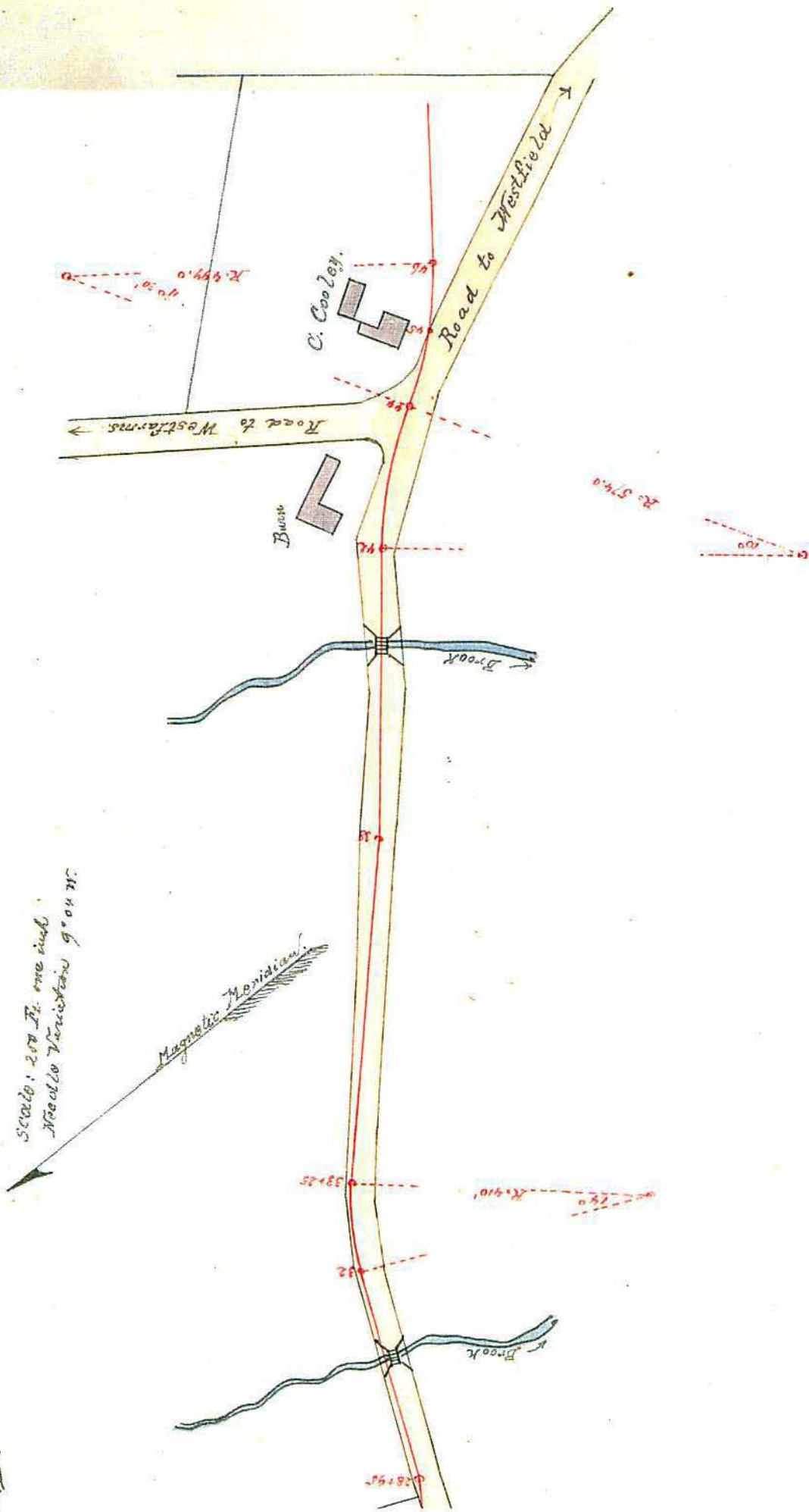
The above description is for the northerly line of lands taken. Said lands taken include all the land lying southerly between the above described line and the Highway containing two acres and fifteen rods (2 acres 15 rods) more or less,

Also the following described Tract of land supposed to belong to said Cooley, commencing at Stake and Stone in easterly line of highway about 35 feet southerly from southeasterly corner of said Cooley's dwelling house and running $S. 53^{\circ} E. 340$ feet to a Stake and Stone in the line between said Cooley and Dennis Atkins,

The above description is for the centerline of location the width of land taken being one rod on each side of said centerline, meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said centerline containing forty-four rods (44 rods) more or less,

The tracing marked "B" hereto annexed is hereby made a part of this description.

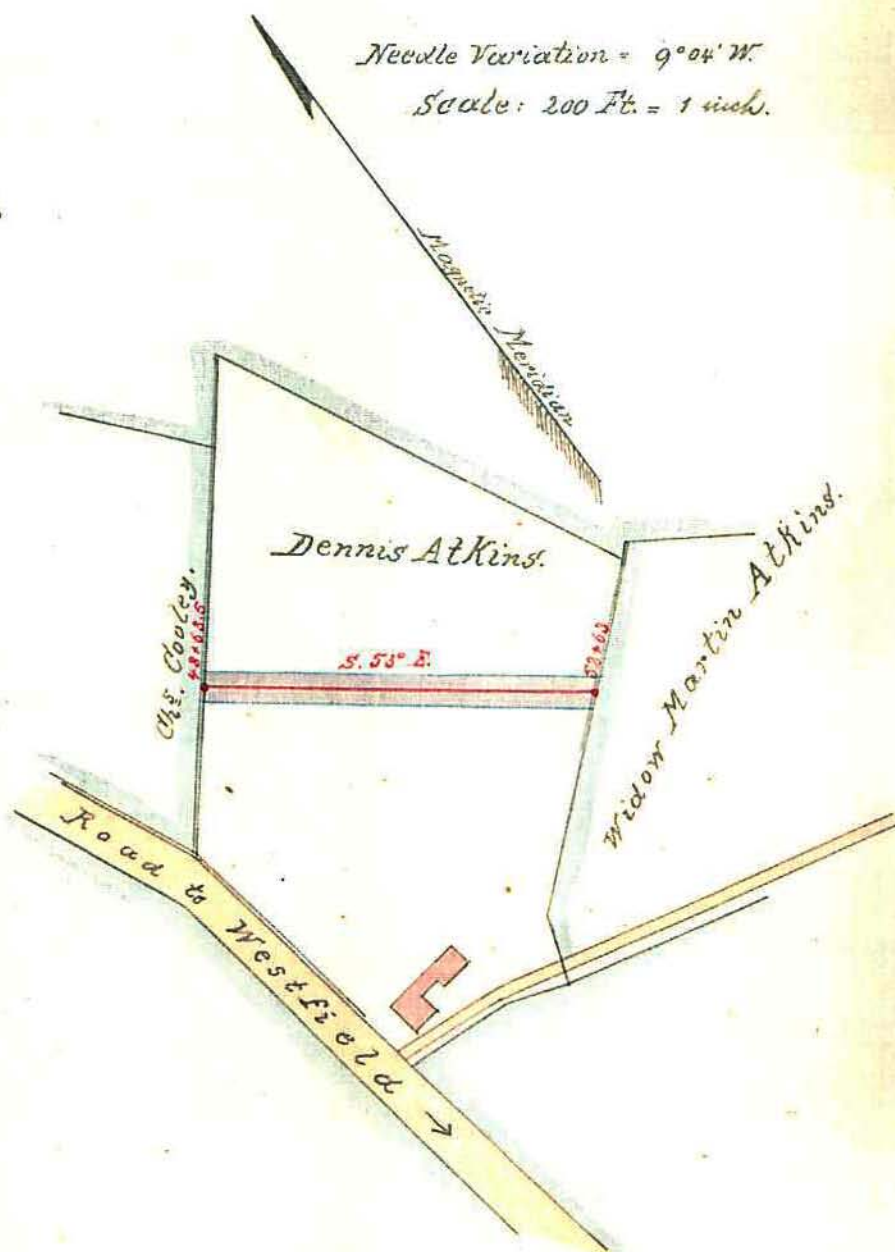
3. B.



Also the following described Tract of Land, the same
being a part of a Highway from Westfield to Montgomery,

Commencing at Sta. 28+31 as shown on tracing marked B.B.
here to annexed a point in the Northerly line of Highway and Southerly
line of land of Charles Cooley Jr and running South Easterly along
said Northerly line of Highway about 1750 feet to a point about
80 feet Southerly of dwelling House of Charles Cooley Jr, The
above description is for the North Easterly side of lands taken
and said lands taken include all land lying between the
above described line and the South Westerly line of said Highway
containing two acres more or less,

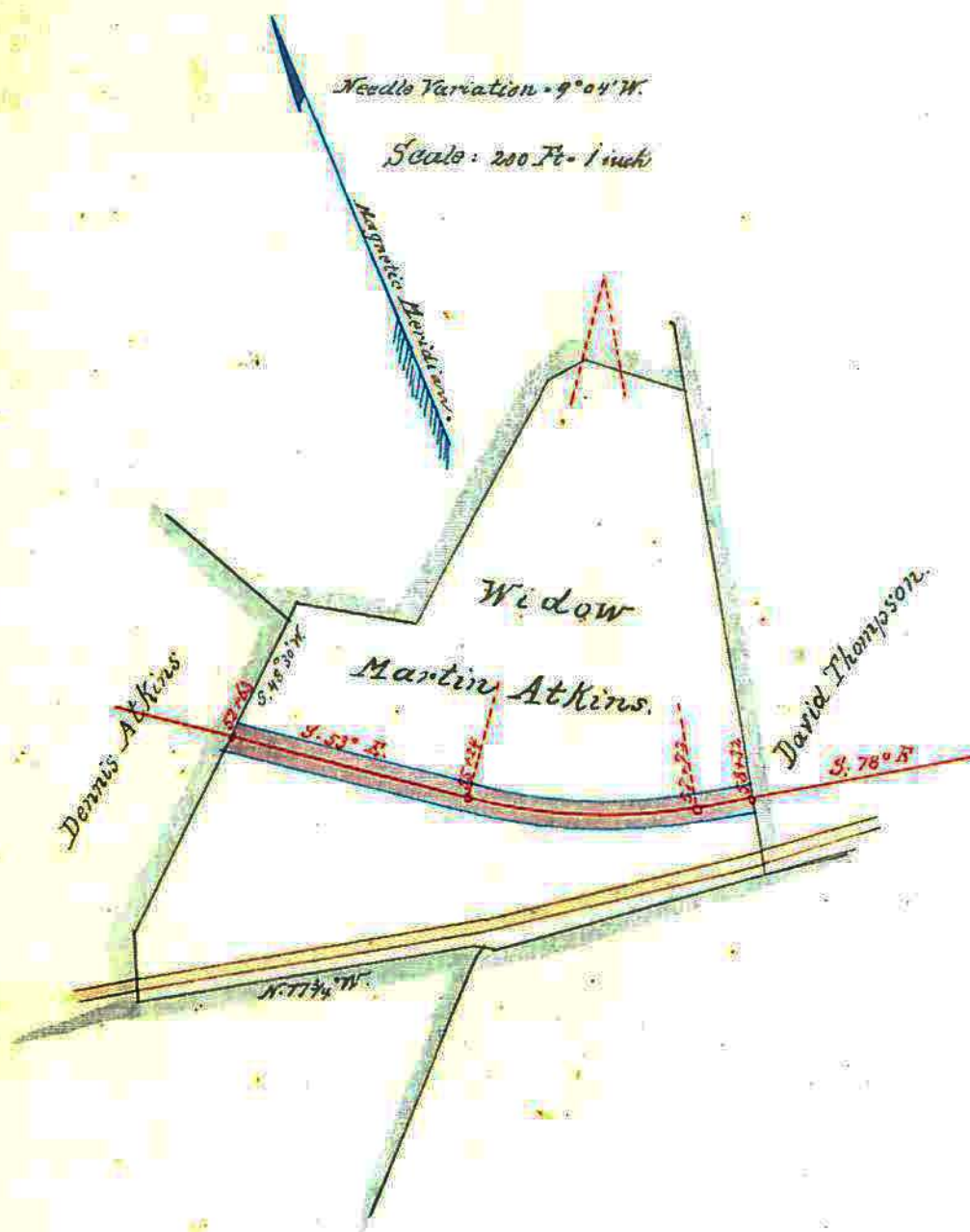
Tracing... C."



Also one certain trachor parcel of Land situated
in Westfield in said county supposed to belong to Dennis
Atkins and described as follows

Commencing at a Stake and
Stone in division line between Charles Cooly^{sr} and Dennis
Atkins Sta. 48+63.5 as shown in tracing marked C. hereto
annexed and running S. 53. E. 600 feet to a Stake and Stone
Sta 52+⁶³~~63~~ in division line between Dennis Atkins and
Widow Martin Atkins,

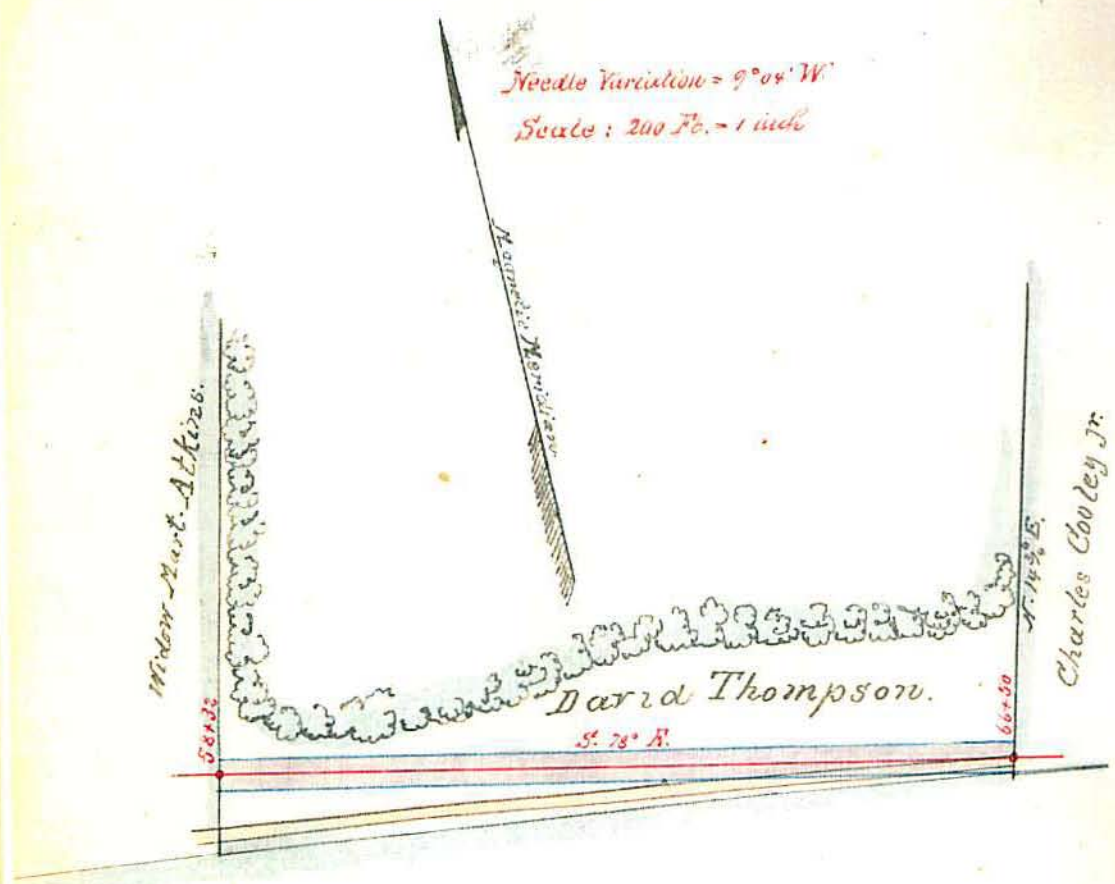
The above description is for the centre
line of location, the width of land taken being one rod on
each side of said centreline, meaning to encompas all land
lying between said division lines and lines parallel with
and one rod right and one rod left of said centreline of
location containing forty-one rods (41 Rods) more or less.



Also one certain Tract or Parcel of Land situated in Westfield in said County supposed to belong to Widow Martin Atkins and described as follows.

Commencing at a Stake and Stone in the division fence between Dennis Atkins and the Widow Martin Atkins Sta 52+63 as shown in tracing marked "D." hence annexed and running S. 53° E a distance of 261 feet to a Stake and Stone at Sta. 55+24 the commencement of a 10° curve (Rod 574.4 ft) to the left or northerly, thence on said curve a distance of 253 feet to Sta. 57+77 the end of said curve, thence on tangent course S. 78° E. 55 feet to Sta 58+32 a point in division fence between Widow Martin Atkins and David Thompson.

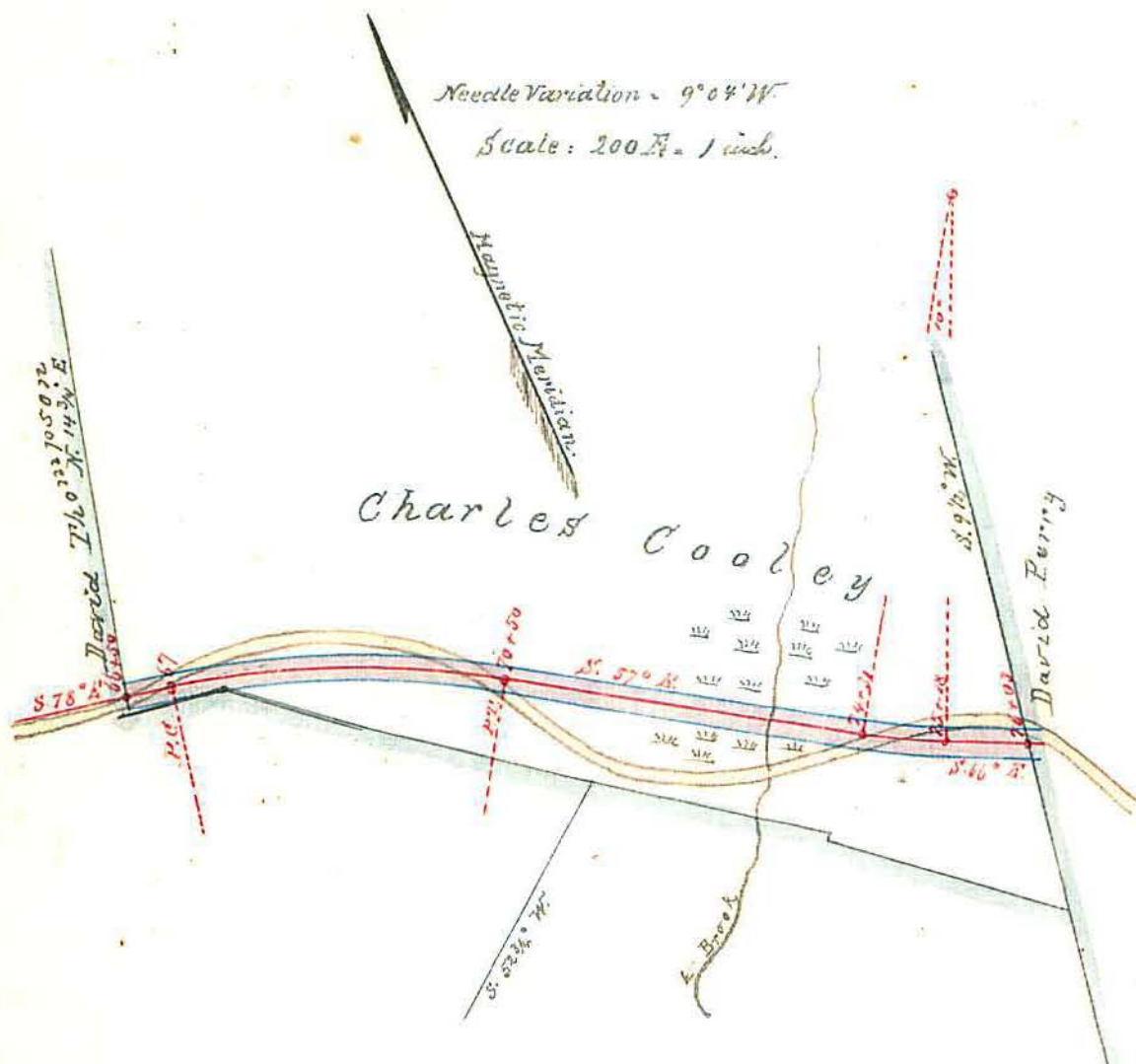
The above description is for the centre line of location, the whole length on centre being 569 feet, the width of land taken being one rod on each side of said centre line meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said centre line of location containing seventy-six rods (76 rods) more or less.



Also my ^{certain} tract or Parcel of Land, situated in Westfield
in said county supposed to belong to David Thompson and
described as follows, Commencing at a Stake and Stone in
division fence between Nathan Martin Atkins and David Thompson
Sta 58+32 as shown in tracing marked "E" here to annexed
and running S 78° E 818 feet to a Stake and Stone at
Sta 66+50 in division fence between David Thompson and
Charles Cooly Jr.

The above description is for the centre line
of location, The width of land taken being one rod on each side
of said centre line, meaning to cover all land lying between
said division lines and lines parallel with and one rod right
and one rod left of said centre line containing ninety-nine
rods (99 Rods) more or less,

Tracing " F. "



N. 455.0

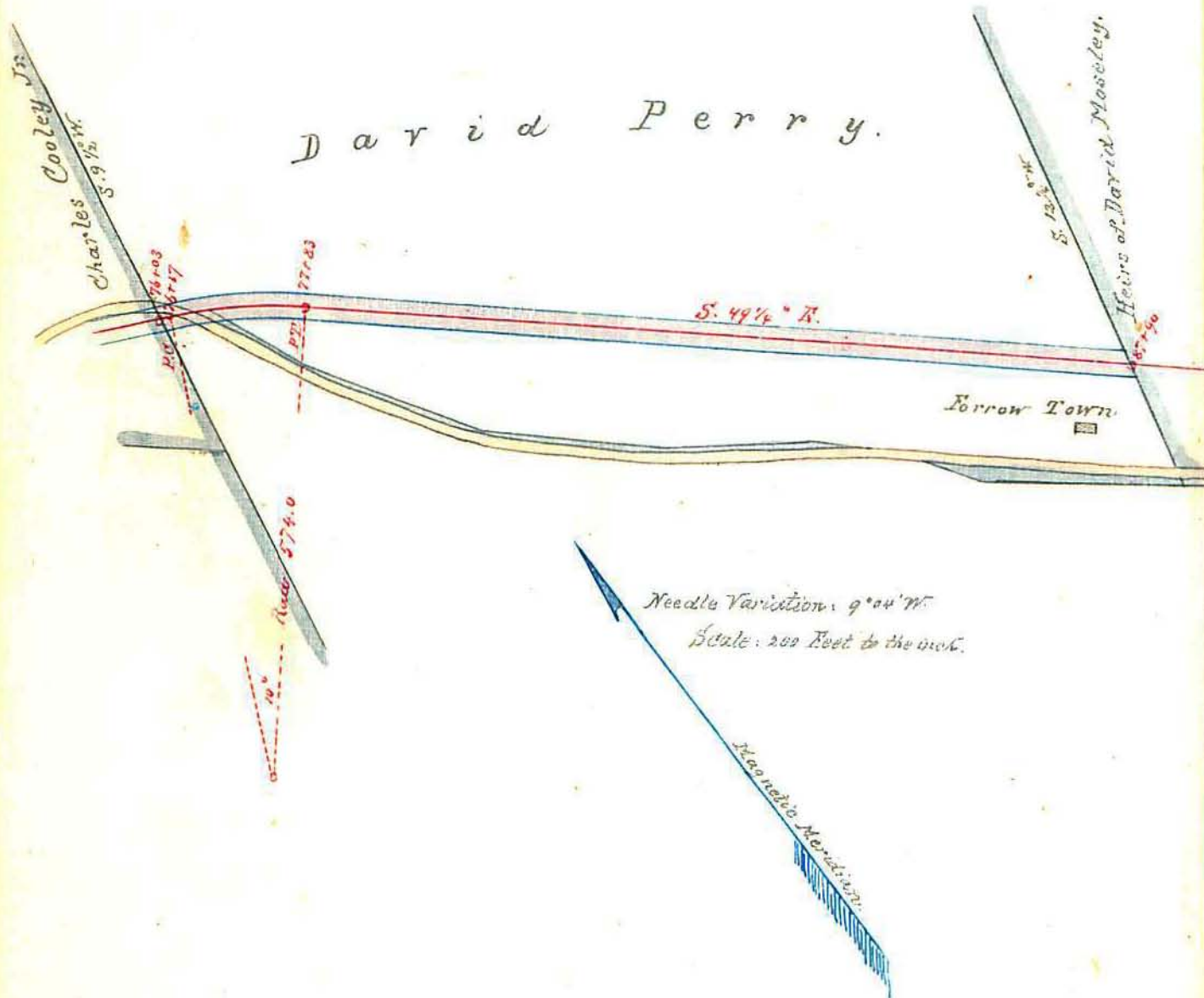
Also one certain Tractor Parcel of Land situated in Westfield in said County supposed to belong to Charles Cooley Jr and described as follows.

Commencing at a Stake and Stone in the division fence between David Thompson and Charles Cooley Jr Sta. 66+50 as shown in tracing marked "F." hereto annexed and running S 78° E 50 feet to a Stake and Stone at Sta. 67 the commencement of a 6° curve (Rad 955 ft) to the right or southerly, Thence on said curve a distance of 350 feet to Sta. 70+50 the end of said curve, Thence on tangent course S 57° E to Sta. 74+31. 381 feet to a Stake and ^{Stone} the commencement of a 10° curve (Rad 574 ft) to the left or northerly, Thence on said curve a distance of 87 feet to Sta. 75+18 the end of said curve, Thence on tangent course S 66° E. 85 feet to Sta. 76+03 a point in division fence between Charles Cooley Jr and David Perry.

The above description is for the centre line of location the whole length on centre being 953 feet, The width of land taken being one rod on each side of said centre line meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said centre line of location, containing (115 Rods) one hundred and fifteen rods more or less.

Tracing "G."

David Perry.

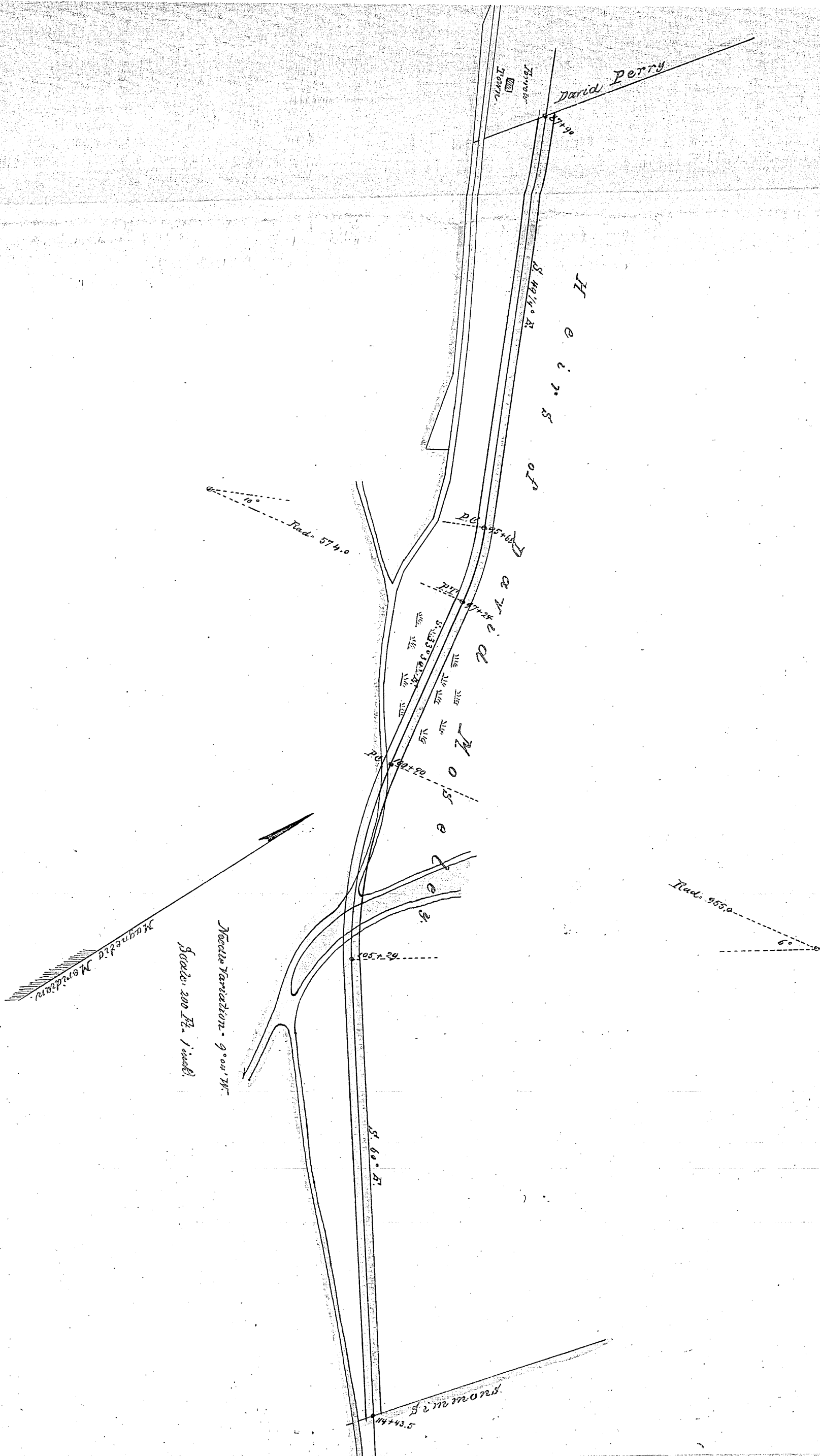


Also one certain Tract or Parcel of Land situated in
Westfield in said County supposed to belong to David Perry
and described as follows,

Commencing at a Stake and Stone in the division fence
between Charles Coolidge Jr and David Perry Sta. 76+03 as shown in
tracing marked. Thence to a corner and running S 66° E a distance
of 14 feet to a Stake and Stone at Sta. 76+17 the commencement of
a 10° curve (Radius 574.0) to the right or easterly, Thence on said curve
166 feet to Sta. 77+83 the end of said curve, Thence on tangent
course S 49 1/4° E 1007 feet to Sta. 87+90 a point in division fence be-
tween David Perry and Heirs of David Moseley,

The above description is for the centre line of location
the whole length on centre being 1187 feet. The width of land
taken being one rod on each side of said centre line meaning
to cover all land lying between the above described division
lines and lines parallel with, and one rod right and one
rod left of said centre line of location, containing one hundred
and forty-four rods (144 rods) more or less.

H

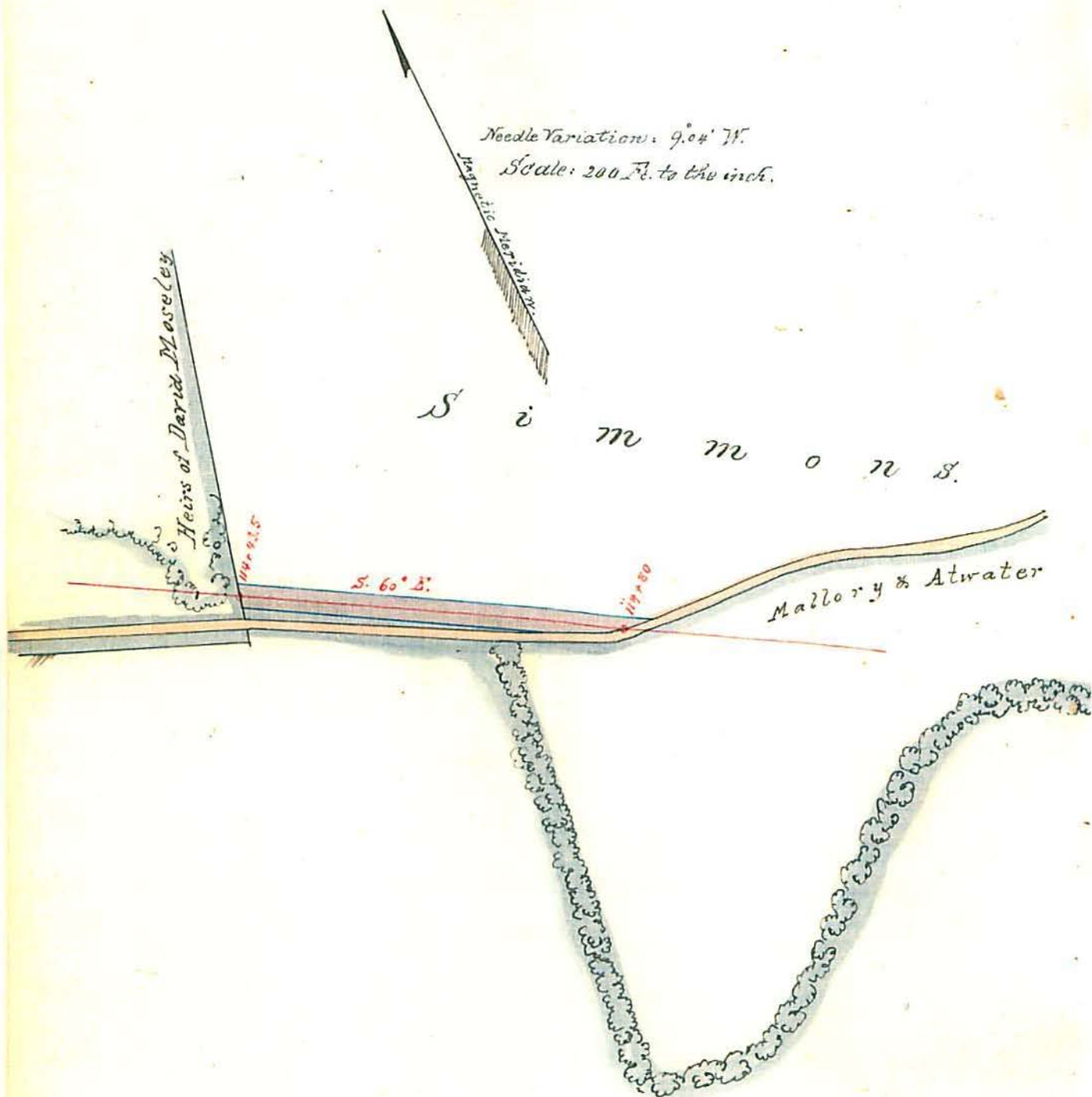


Also one certain Tract or Parcel of Land situated in Westfield in said County supposed to belong to Hairs of David Mosely and described as follows.

Commencing at a Stake and Stone in the division fence between David Perry and Hairs of David Mosely Sta. 87+90 as shown in tracing marked. H. Hunt annexed and running $S 49^{\circ} 14' E$ 776 feet to a Stake and Stone at Sta. 95+66 the commencement of a 10° curve (Radius 574') to the right or southerly, Thence on said curve a distance of 158 feet to Sta 97+24 the end of said curve, Thence on tangent course $S 33^{\circ} 30' E$ 366 feet to Stake and Stone at Sta 100+90 the commencement of a 6° curve (Radius 955 ft) to the left or northerly, Thence on said curve a distance of 439 ft to Sta. 105+29 the end of said curve, Thence on tangent course $S 66^{\circ} E$ 914.5 ft to Sta. 114+43.5 a point in division fence between Hairs of David Mosely and Simmons,

The above description is for the centerline of location the whole length on centre being 2653.5 feet; The width being one rod on each side of said centre line meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said centre line of location containing two acres and two rods (2 Acres 2 Rods) more or less

Tracing. " I. "



Also one certain Tract or Parcel of Land situated
in Westfield in said county, supposed to belong to _____
Simmons and described as follows,

Commencing at Stake and Stone in division fence
between Heirs of David Mosely and Simmons Sta:
114+43.5 as shown in tracing marked, "I" here to accused and
running S 60° E 536.5 feet to Sta. 119+80 a point in division fence
between said Simmons and Mallory & Shwater,

The above description is for the centre line of location,
the whole length on centre line being 536.5 feet. The width of
land taken being one rod on each side of said centre line,
meaning to cover all land lying between the above described
division lines and lines parallel with and one rod right and
one rod left of said centre line of location, containing six-
ty rods (65 Rods) more or less,

(Also one certain Tract or Parcel of Land situated ^{Westfield} in said county supposed to belong to Mallory and Atwater and described as follows.

Commencing at a Stake and Stone in the division fence between Simmons and Mallory and Atwater Sta. 119+80 as shown on tracing marked "J" hereunto annexed and running S. 60° E. 920 feet to a Stake and Stone at Sta 129+20. Thence running S 32 1/4° E 1325 feet to Sta. 142+25 a point in division fence between Mallory and Atwater and John Lincoln.

The above description is for the centre line of location the whole length on centre being 2245 feet. The width of land taken being one rod on each side of said centre line meaning to cover all land lying between the above described division lines and line parallel with and one rod right and one rod left of said centre line of location, containing one acre one hundred and twelve rods more or less

Tracing "K".

J e r e D e n e e n.

Teamans

Heirs of

Col. David Moseley.

S. 32 1/4 E.

Scale: 200 ft. = 1 in.

Magnetic Variation - 9° 04' N.

Magnetic Meridian

S. 22° E.

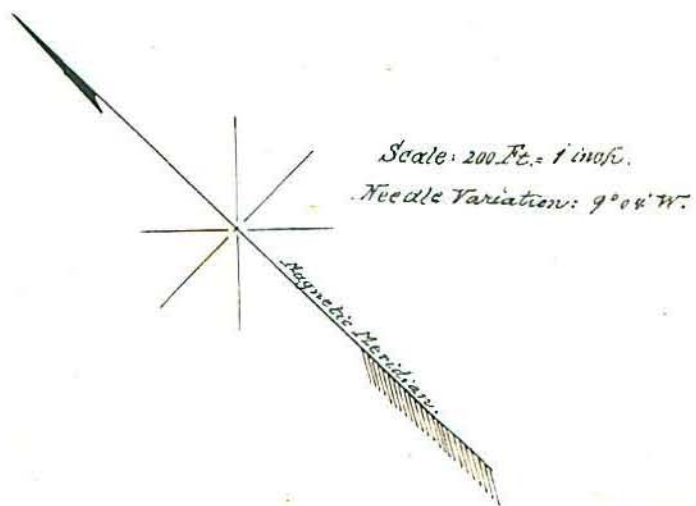
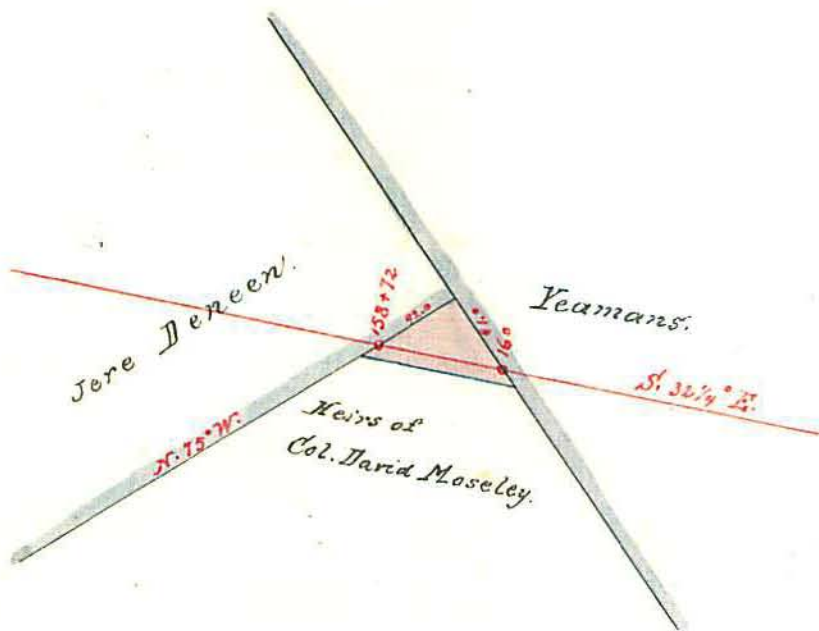
Malory & Water

S. 12° E.

Also one certain Tract or Parcel of Land situated in Westfield in said County supposed to belong to John Deneen and described as follows.

Commencing at a Stake and Stone in the division Fence between Mallory and Atwater and John Deneen Sta. 142+25 as shown on tracing marked. Thence commenced and running $S 32^{\circ} 14' E$ 1647 feet to Sta. 158+72 a point in division fence between John Deneen and Heirs of ^{Col.} David Mosley.

The above description is for the centre line of location the whole length on centre being 1647 feet. The width of land taken being one rod on each side of said centre line meaning to cover all land lying between the above described divisions lines and lines parallel with one rod right and one rod left of said centre line of location. Containing one acre thirty-nine rods (1 Acre 39 Rods) more or less.

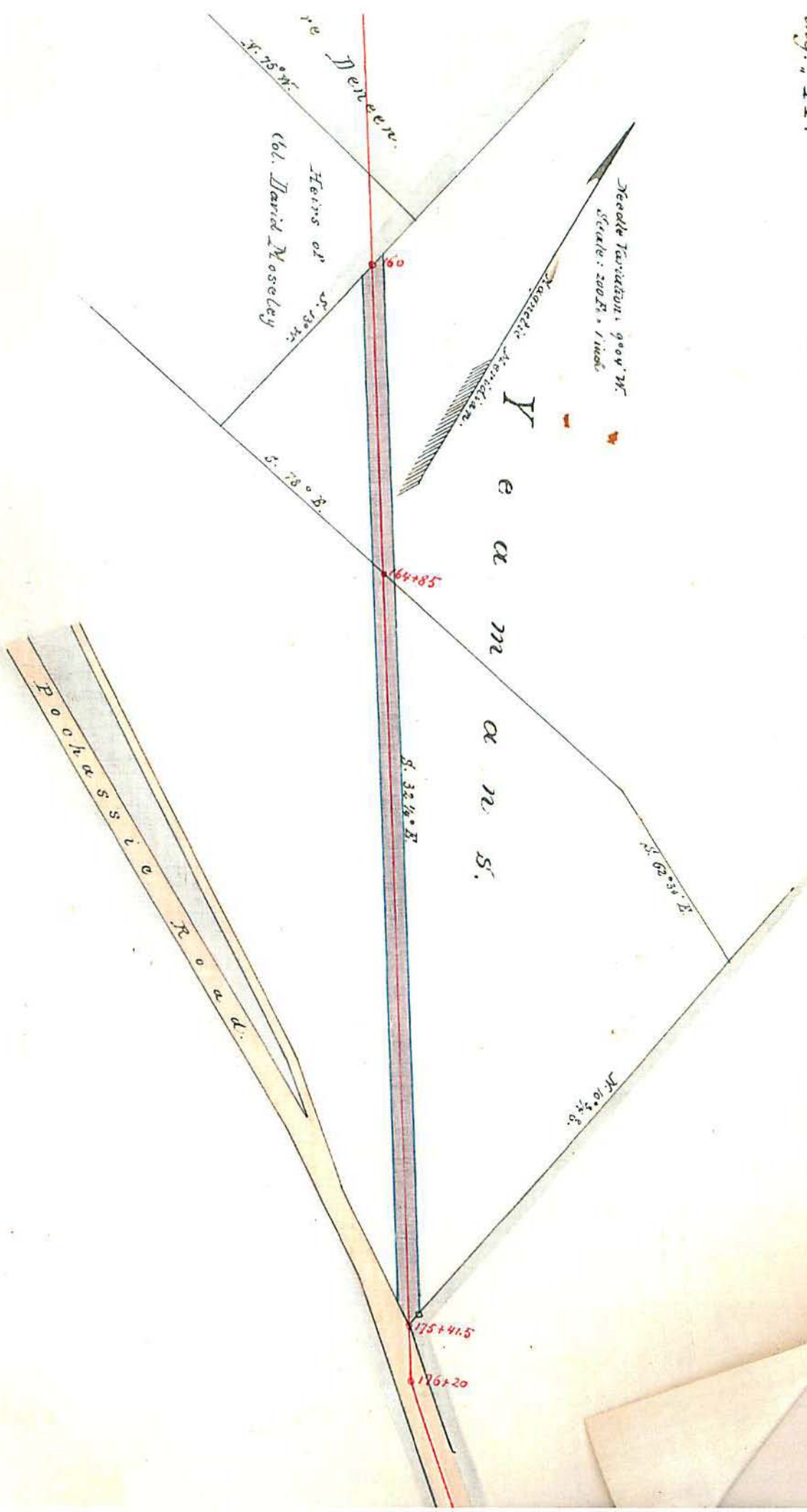


Also, one certain Tractor Parcel of land situated in Westfield in said County supposed to belong to Heirs of Col. David Moseley and described as follows,

Commencing at a Stake and Stone in the division fence between Jem. Denun and Heirs of Col. David Moseley Sta. 158+72 as shown in tracing marked "L" here annexed and running S $32\frac{1}{4}^{\circ}$ E 128 feet to a Stake and Stone Sta. 160 a point in division fence between Heirs of Col. David Moseley and Ycauans,

The above description is for the centre line of location the whole length on centre line being 128 feet. The width of land taken being one rod to the right or southerly and all the land to the left or northerly of said centre line to lands of Ycauans and Jem. Denun, containing twenty three rods (23 Rods) more or less.

ing. M.



Also one certain Tractor Parcel of Land situated
in Westfield in said County supposed to belong to _____
Yamans and described as follows,

Commencing at a Stake and Stone in the division fence
between heirs of Col. David Mosely and Yamans
Sta. 160. as shown in tracing marked "M" ^{here} to be run and
running S $32\frac{1}{4}^{\circ}$ E 1541.5 feet to a Stake and Stone at Sta. 175 + 41.5 a
point in the northerly line of Pochassie Road.

The above description is for the centre line of location the
whole length on centre being 1541.5 feet, the width of land
taken being one rod on each side of ^{said} centre line meaning to
cover all land lying between the above described division lines
and lines parallel with and one rod right and one rod left of
said centre line of location, Containing one acre twenty-six
rods (1 acre 26 rods) more or less,

Heamans

N. 32 1/2° W.

514+561

176+20

N. 47° 50' W.

P o o h a s s e o

R o a n

151+51.5

Patrick
Heas

6189+02

Magnetic Meridian

Scale: 200 ft. to the inch
Magnetic Variation: 9° 04' W.

Also the following described Tract or Parcel of land,
said Tract being a part of a Highway in the Town of Westfield
known as,

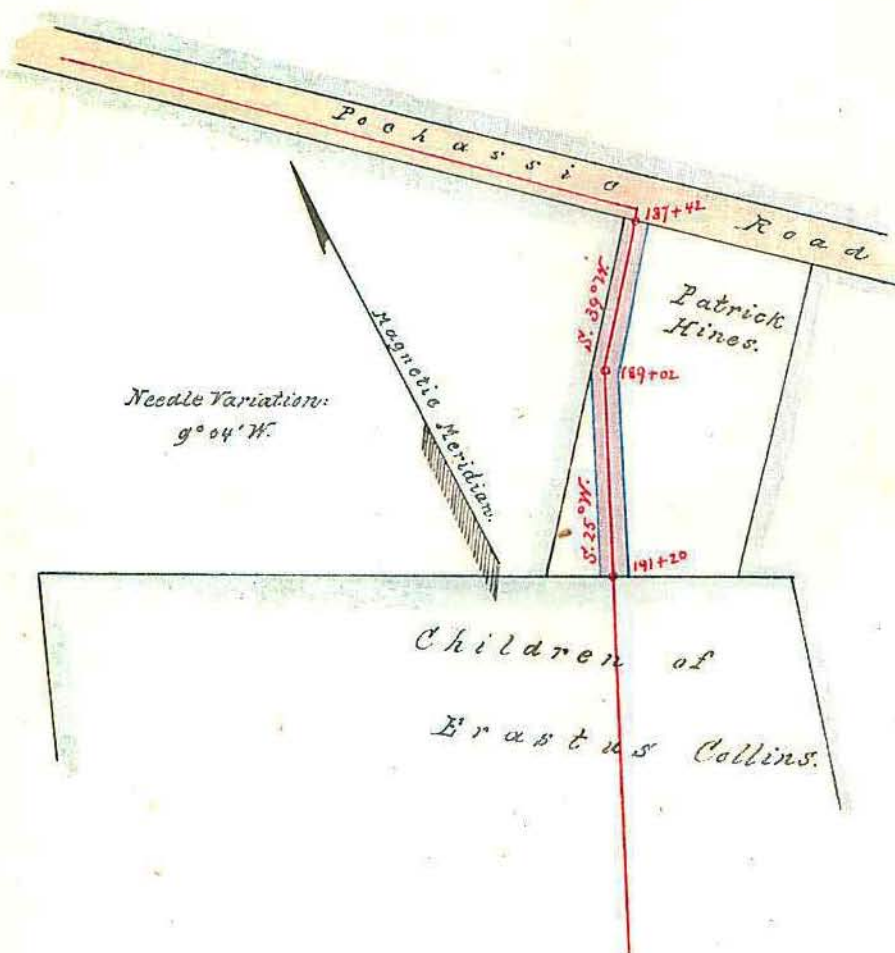
Pochassie Road.

Commencing at a point in Northernly lines of said road
and three rods westerly of Ycauau's easterly line and
running on said northernly line of Street to a point three
rods easterly of Patrick's lines westerly line a distance of
about 1288 feet.

The above description is for the northernly line of location,
the land taken includes all the land southerly of said line
to the southerly line of Highway.

The tracing marked "M.M." hereto annexed is hereby
made a part of this description.

Tracing. "N."



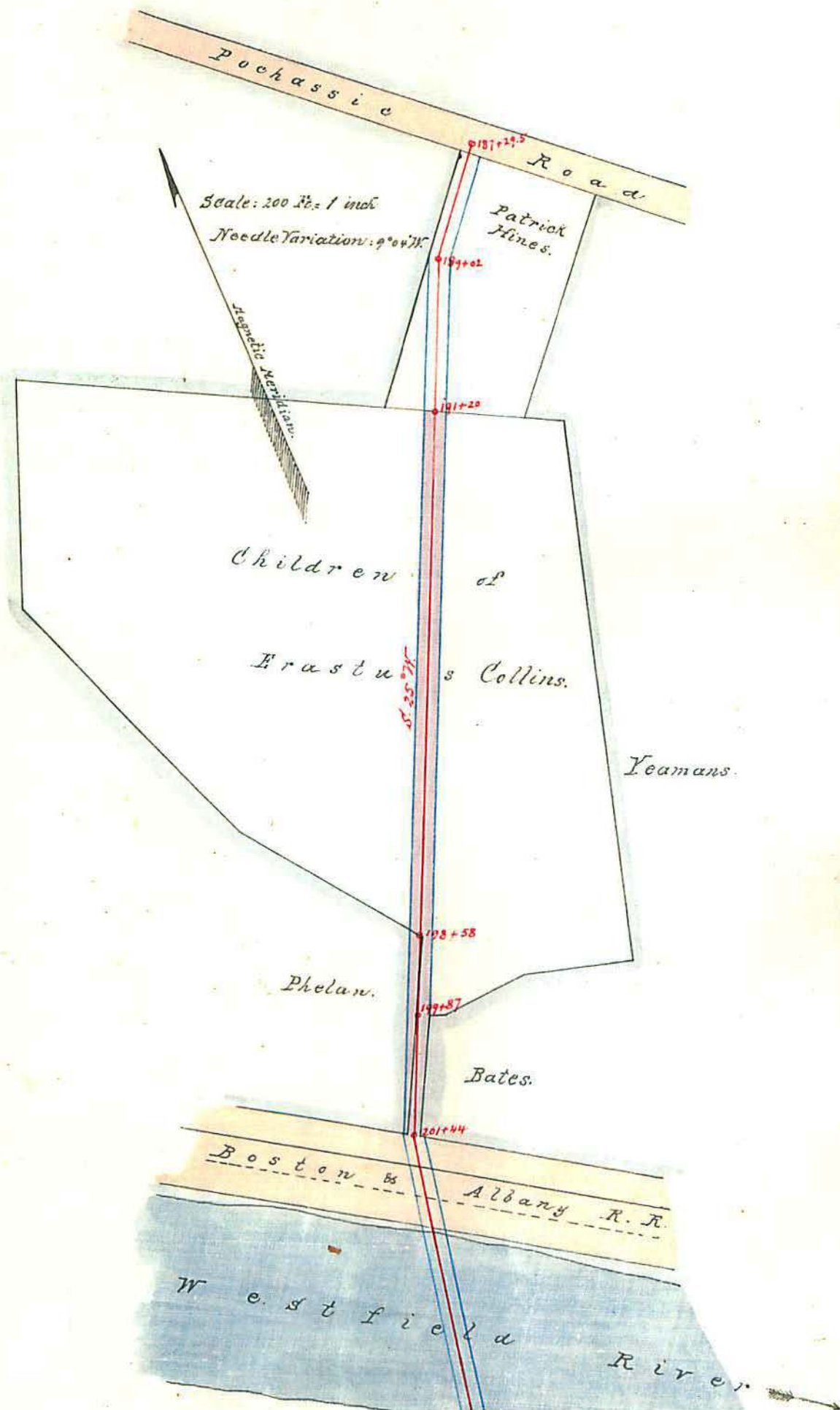
Scale: 200 Ft. = 1 inch.

Also one certain Tractor Parcel of land situated in Westfield in said county supposed to belong to Patrick Kines and described as follows.

Commencing at a Stake and Stone in the southerly line of Peckassie Road and in Northerly line of Patrick Kines lot and one rod easterly of line between said Kines and Mrs Reagan at Sta. 187+40 as shown on tracing marked. A line to annexed and running S 39° W 162 feet to Stake and Stone at Sta 189+02, Thence S 25° W 210 feet to Sta 191+12 a point in division fence between Patrick Kines and Erasmus Collins. Children

The above description is for the centre line of location the whole length ^{of land taken} ~~on centre~~ being 372 feet, the width being one rod on each side of said centre line meaning to cover all land lying between the above described division lines and lines parallel with and one rod right and one rod left of said centre line of location containing forty-five rods (45 Rods) more or less.

Tracing, O."



Also one certain Tract or Parcel of land situated in Westfield in said County and supposed to belong to Erastus Collins; Children and described as follows,

Commencing at a Stake and Stone in division line between Patrick Hines and said Collins, Children at Sta. 191+20 as shown on tracing marked "O" here to accused and running S 25° W about 1074 feet to a point in the northerly line of Pochassic St. and 8 1/2 feet westerly of Bates S.W. corner, the above description is for the center line of location, the width of land taken being one rod on each side of said center line excepting from Sta 199+87 a point at right angles to and one rod westerly of Bates S.W. corner to Pochassic St., the land taken is bounded on the left or easterly by Bates west line the width on the right or westerly being one rod, meaning to cover all land above described supposed to belong to Collins Children not covered by the description of land taken from John and Elisha Philau, containing 106 Rods more or less,

Also one certain Tract or Parcel of land situated in Westfield in said County supposed to belong to John & Elisha Philau and described as follows,

Commencing at a Stake and Stone in the division line between said Philau & Collins Children at Sta 198+58 as shown in Tracing marked "O" here to accused and running S 25° W 286 feet to Sta 201+44 a point in the northerly line of Pochassic St. and 8 1/2 feet westerly of

Bates west line, the above description is for the center line of location, the land taken lying partly on the right or westerly & partly on the left or easterly and includes all lands supposed to belong to said Philaus between above named Stations and a line one rod westerly of said center line and easterly to supposed lands of Collins Children as above described

Also one certain Tracher Parcel of land situated in Westfield in said County supposed to belong to the Boston & Albany RR and described as follows,

Commencing at a point in the northerly line of location of said B. & A. RR at Sta 201+93 as shown on tracing marked "Phints annexed and running $S 11\frac{1}{4}^{\circ} N 90$ feet to the southerly line of said RR location at Sta. 202+90 the width of land taken being one rod each side of said centre line meaning to cover all land lying between the above described divisions lines and lines parallel with and one rod right and one rod left of said centre line of location, containing twelve rods (12 Rods) more or less,

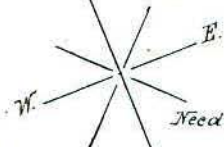
Also one certain Tracher Parcel of land situated in Westfield in said County supposed to belong to Samuel Horton and described as follows,

Commencing at a point at the southerly line of B. & A. RR location at Sta 202+83 and running $S 11\frac{1}{4}^{\circ} W$ to the North side of Westfield River a distance of about 10 feet meaning to cover all land lying between the southerly line of the B. & A. RR location and the Westfield River and one rod right and one rod left of above described line, supposed to belong to Samuel Horton containing one and one half rods more or less,

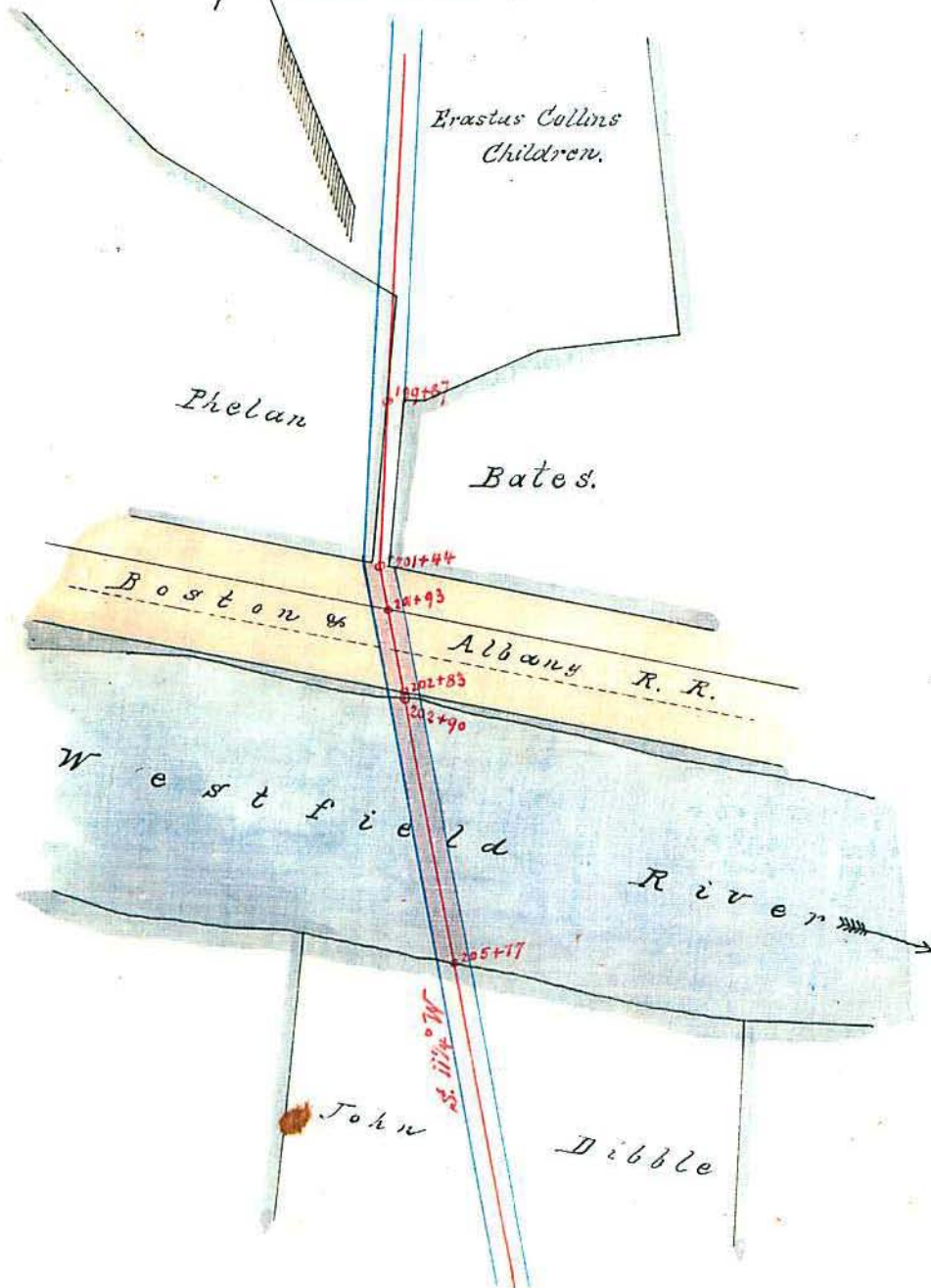
Also from last named point across the Westfield River to land of John Gibble a distance of about 287 feet, the width of land taken being one rod each side of above described line,

Tracing. P.

Scale: 200 Ft. to the inch.



Needle Variation = $9^{\circ}04'W$.



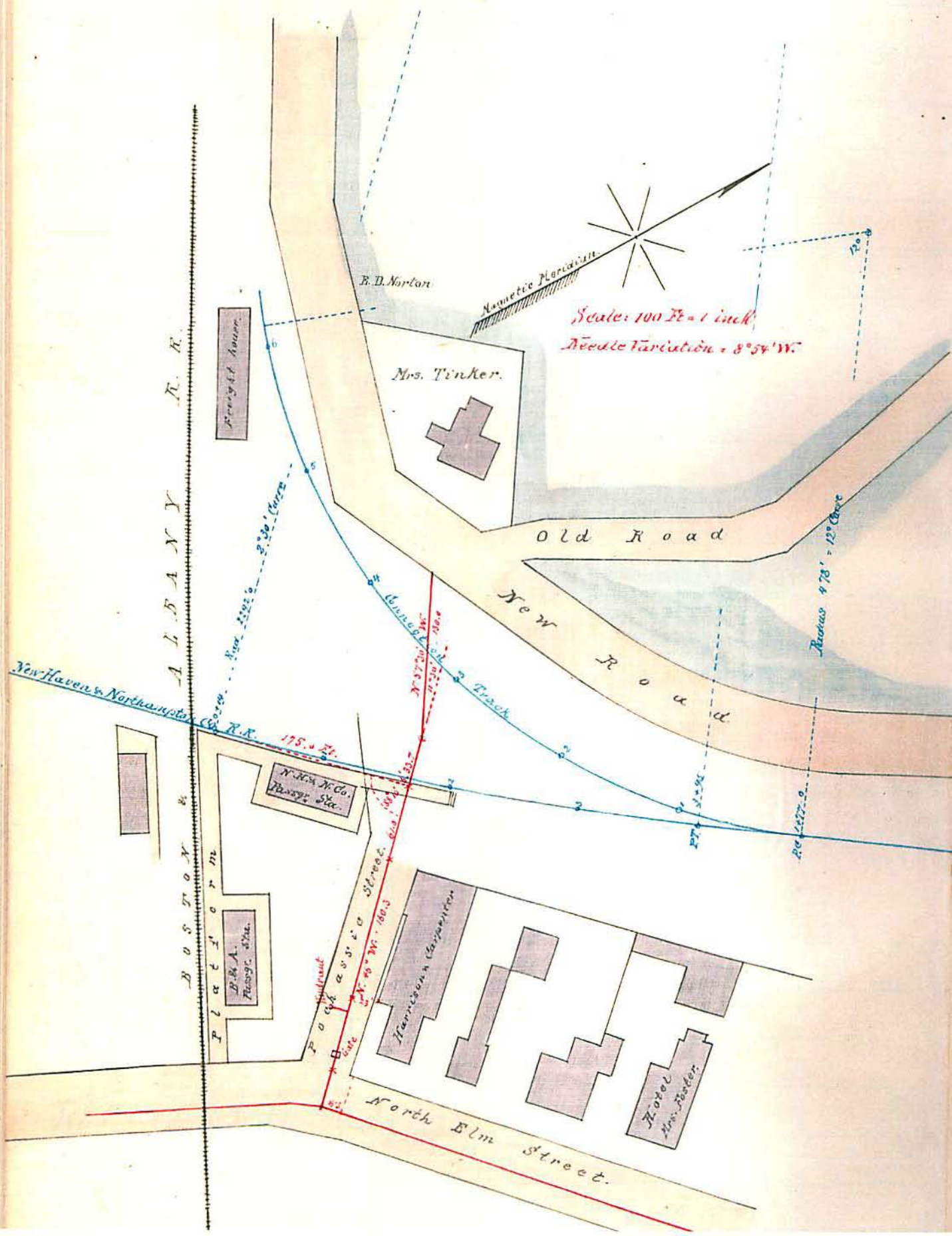
Also one certain Tract or Parcel of land situated in Westfield in
said County supposed to belong to

John Dibble and described as follows,

Commencing at Stake and Stone at the southerly side of Westfield
River at Sta. 205+77 as shown in Pracing marked R^h into corner and
running $S 11\frac{1}{4}^{\circ} W 543$ feet to Stake and Stone in division line between
said Dibble and Town of Westfield at Sta. 211+20. The above description
is for the centre line of location, the width of land taken being one
rod each side of said centre line, - meaning to cover all land lying
between the Westfield River and land belonging to Town of Westfield
and lines parallel with and one rod right and one rod left of said
centre line containing sixty-six rods (66 Rods) more or less,

Also a Strip of land ^{supposed to} belonging to the Town of Westfield from
Sta 211+20 to the southerly side of Dyke in Clark Street a distance
of about 113 feet same course as last described centre line, The width
^{of land} taken being one rod each side of said centre line containing
fourteen rods (14 Rods) more or less,

Tracing "S."



Location across New Haven & Northampton Co. R.R.

Commencing at an Elm monument on the westerly line of Hedyoke and Westfield R.R. location and in Easterly line of New Road as built by ~~W. & N. Co.~~ and running $S 57^{\circ} 30' E$ 130 feet to a point $33 \frac{1}{2}$ feet westerly of Centre line of ~~N. & N. Co.~~ Main Track, thence $S 46^{\circ} E$ about 67 feet to the easterly line of N. & N. R.R. Location, The last described line crosses a Tangent produced from P.C. 14 feet North of North Rail of Boston & Albany R.R. at a distance of 175 feet northerly from said North Rail and six feet easterly of Centre line of Main Track of ~~N. & N. Co.~~ The included angle of the tangent lines and line of location running westerly as shown on Tracing is $88^{\circ} 10'$. The above description is for the Centre line of location the width of land taken being one Rod on each side of said Centre line containing 24 rods more or less.

Also commencing at the easterly line of R.R. location above mentioned and running about 160 feet course $S 46^{\circ} E$ same as last course above described to the westerly line of North Elm Street, The above description is for the Centre line of location the width of land taken being one rod each side of said Centre line containing twenty Rods (20 rods) more or less.

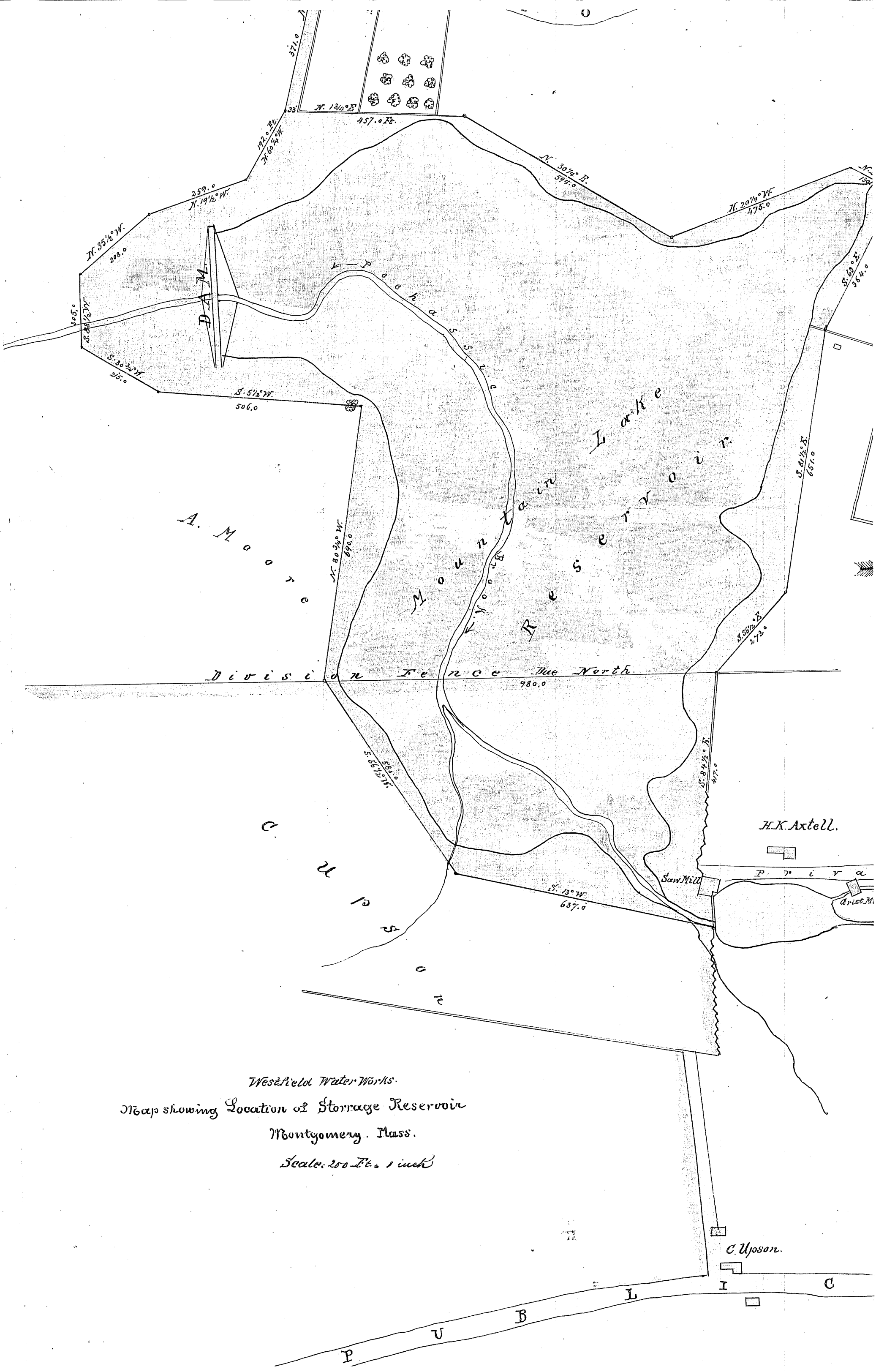
The tracing marked "S" hereto annexed is hereby made a part of this description.

The foregoing Plans and Descriptions
are to the best of my Knowledge and belief a correct
Description of Lands taken for Westfield Water
Works.

L. H. Root Esq.

Westfield July 11th 1874.

Ruben A. Oke	} Water Commissioners for the Town of Westfield
Levin R. Norton	
Chas. M. Yarnall	
Wm. J. Bush	
Saml. Horton	



Westfield Water Works.
 Map showing Location of Storage Reservoir
 Montgomery, Mass.
 Scale: 200 Ft. = 1 inch

Se Koa.
McC.

E. Cole.

1

Baranof.

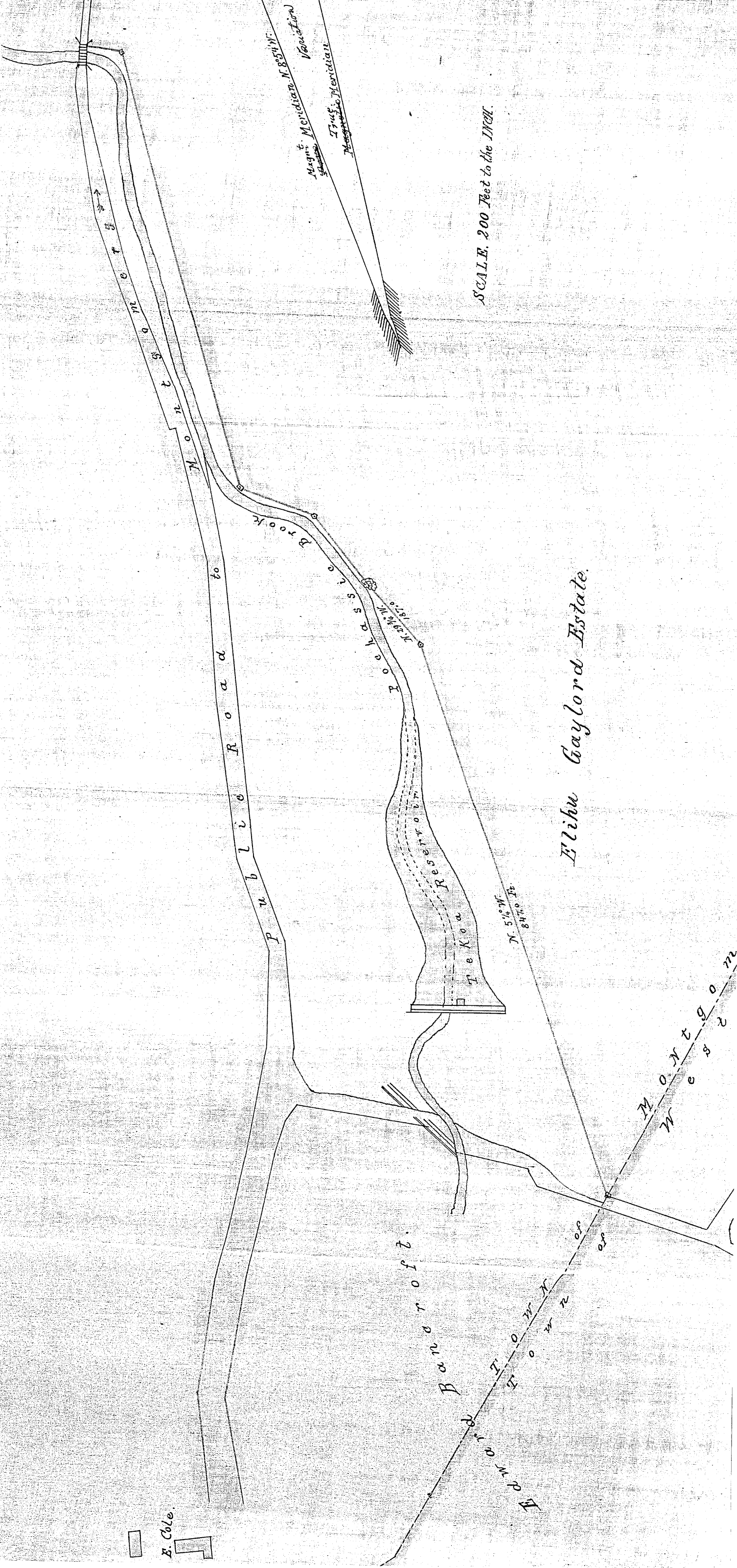
Baranof.

Baranof.

Baranof.

Elihu Gaylord Estate.

SCALE. 200 Feet to the INCH.



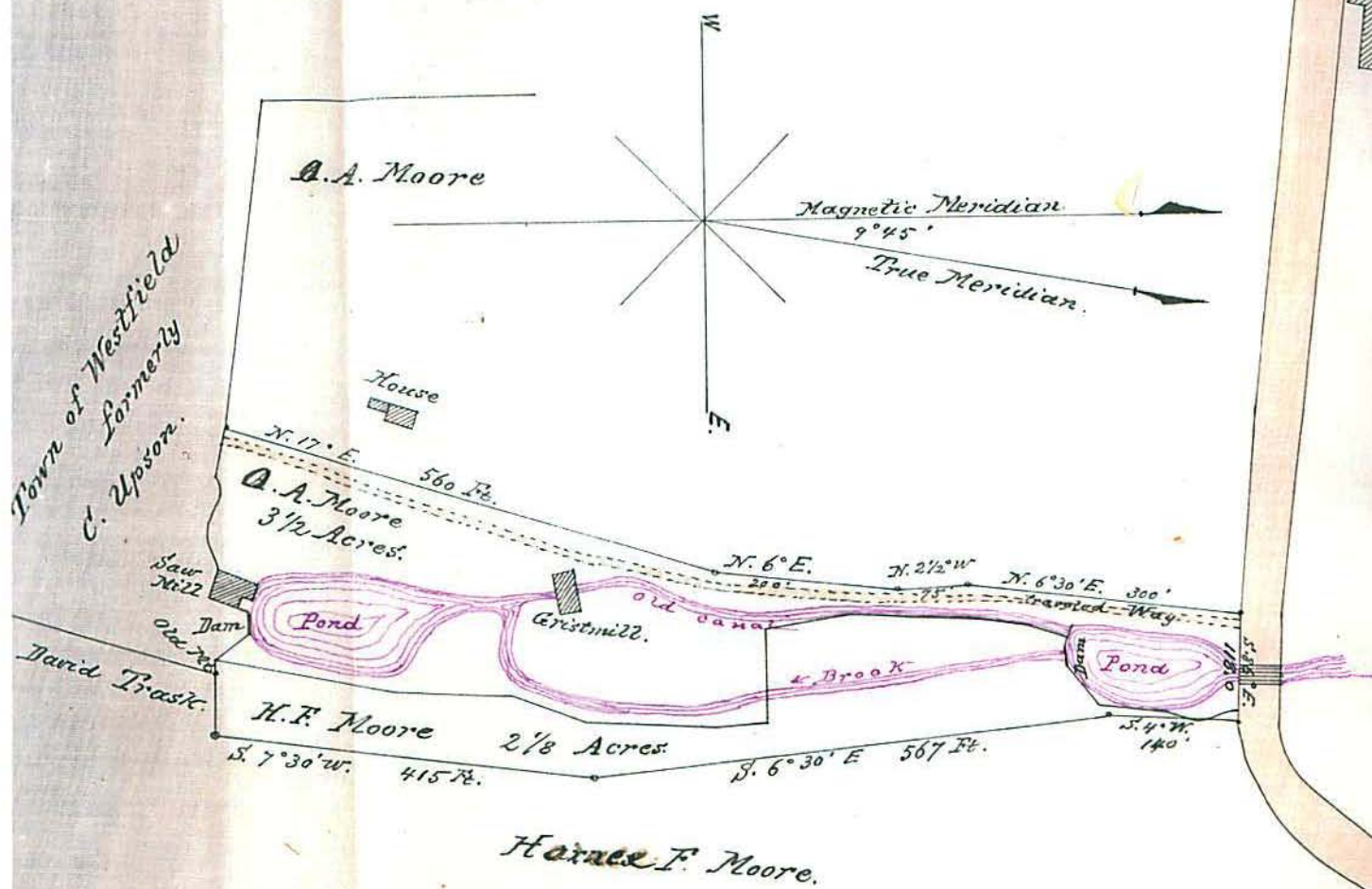
M o n t g o m e r y
M o n t g o m e r y
M o n t g o m e r y

For Description of Tracings opposite, see Hampden County
Register of Deeds Book 308 Page 346.

L. H. Root Esq.

Received July 18th 1874 and filed with Hampden
County Deeds

Attest James C. Russell Register



Westfield^{} Water Works*

Map

*Showing Location of Mill Property
of*

Q. A. Moore.

Montgomery, Mass.

Surveyed by L. F. Root. C.E. Dec. 1883

Scale: 200 Ft. = one inch.

The town of Westfield in accordance with the authority given by an Act of the Legislature of Massachusetts entitled "An act to supply the town of Westfield with pure Water" Approved May 29th 1873. and for the purposes named in the 1st and 3^d sections of said Act. have taken and do hereby take the following described land situate in Montgomery. Hampden County, Massachusetts. said land lying southeasterly of the Dwelling house of Oliver A. & Oterlong Moore and Southwesterly of the dwelling of H. F. Moore and supposed to belong to Oliver A. Moore & H. F. Moore.

Starting at an iron monument in the stone wall about seventy feet westerly of brook & on the southerly side of Highway leading from Oliver A. Moore's house to H. F. Moore's house. thence running S. 86° E. 118 feet to iron monument by bar post. thence S. 4° W. 1140 feet to iron monument. thence S. 6° 30' E. 567 feet to iron monument. thence S. 7° 30' W. 415 feet to iron monument. to land of David Trask. thence westerly along the division line between lands of H. F. Moore & David Trask about 70 feet. to stake & stones. (This last monument is the one described in a former instrument made by the town of Westfield and recorded in said Hampden County Registry of Deeds Book 308 page 346) thence westerly along the face of dam and mill and on the line of an irregular fence to an iron monument near bar-way of a traveled way. being about 270 feet westerly of the last mentioned monument. thence N. 17° E. 560 feet to iron monument. thence N. 6° E. 200 feet to iron monument. thence N. 2° 30' W. 75 feet to iron monument. thence N. 6° 30' E. 300 feet. to place of starting.

The last two courses are along the westerly side of stone wall. The above described land is bounded northerly by the highway. Easterly

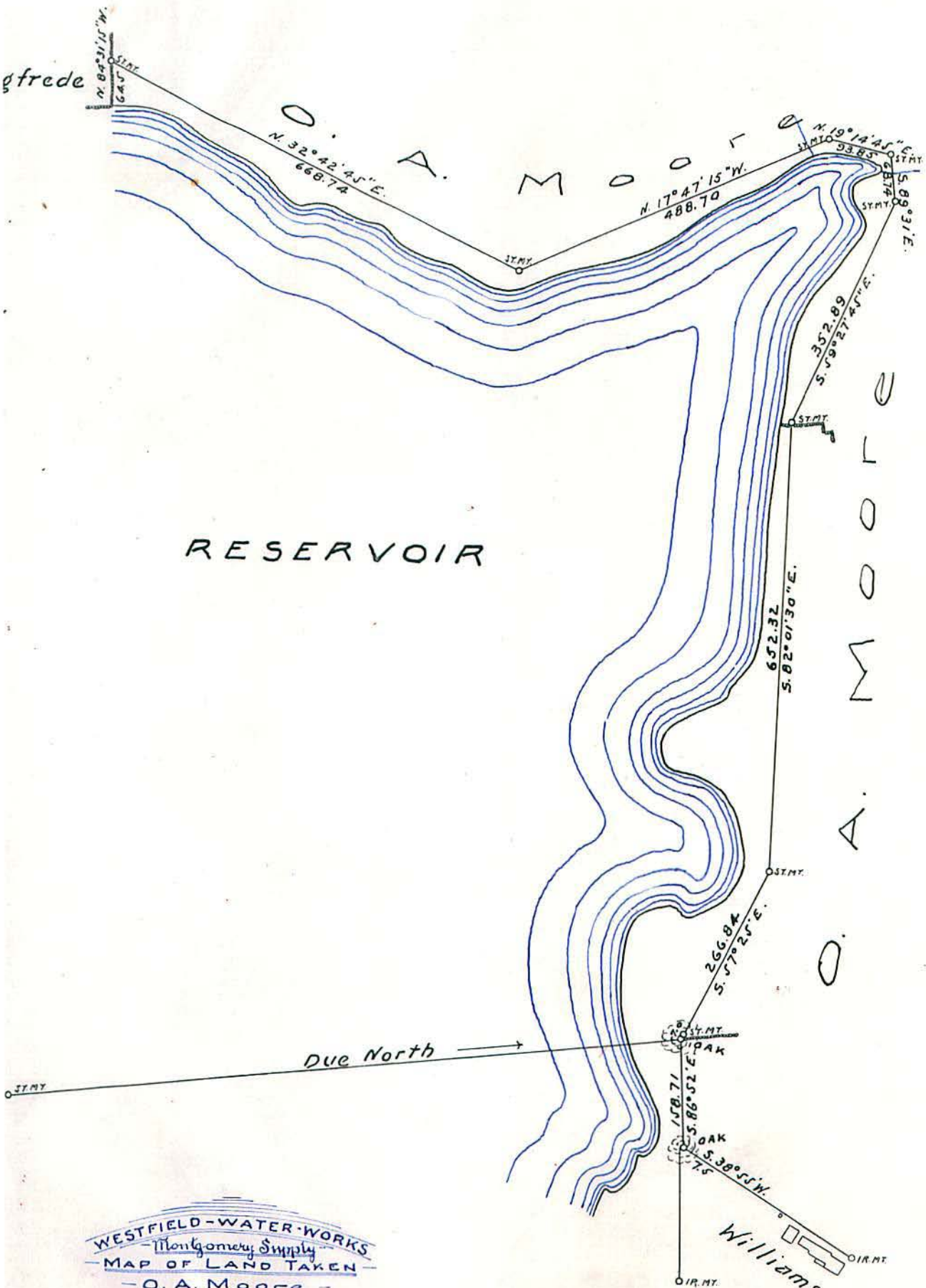
by land of Horace T. Moore. Southerly by land of David Trask
& the town of Westfield and westerly by land of Oliver A. Moore.
& contains 5 acres & 100 rods more or less.

For further description see Map. hereto annexed dated Dec
1883. surveyed by L. F. Root. Variation of Needle $9^{\circ}45'W$.

Dated at Westfield Mass. this 20th day of December A.D. 1883.

Ruben Noble	}	Water Commissioners
Lewis R. Norton		for the
Chauncey D. Allen		Town of Westfield.

Received December 26th 1883 and Filed in
Hampden County Mass Registry of Deeds
Attest James E. Russell Register



WESTFIELD-WATER-WORKS
 -Montgomery Supply
 -MAP OF LAND TAKEN-
 -O. A. MOORE-
 -SCALE: 200 FT. = 1 INCH.-
 -ORENE PARKS-C.E.-
 -1904.-

Land taken of Oliver A. Moore, November 21, 1904.

KNOW ALL MEN,

That the Town of Westfield, in accordance with the authority given by an Act of the Legislature of Massachusetts entitled "An Act to Supply the Town of Westfield with Pure Water," approved May 29th., 1873 and for the purposes named in the 1st. and 3rd. sections of said act, have taken and do hereby take the following described land situated in Montgomery, Hampden County, Massachusetts, and supposed to belong to Oliver A. Moore:-

Commencing at the north-easterly corner of land now or formerly of one Bargfrede and in the westerly line of land of Town of Westfield, thence running North $84^{\circ} 31' 15''$ West along the division line between land of said Bargfrede and land of Oliver A. Moore, sixty-four and five tenths (64.5) feet to a stone monument, thence North $32^{\circ} 42' 45''$ East six hundred sixty-eight and seventy-four one-hundredths (668.74) feet to a stone monument, thence North $17^{\circ} 47' 15''$ West four hundred eighty-eight and seven tenths (488.7) feet to a stone monument, thence North $19^{\circ} 14' 45''$ East ninety-three and eighty-five one-hundredths (93.85) feet to a stone monument, thence South $89^{\circ} 31'$ East sixty-eight and seventy-four one-hundredths (68.74) feet to a stone monument, thence South $59^{\circ} 27' 45''$ East three hundred fifty-two and eighty-nine one-hundredths (352.89) feet to a stone monument, thence South $82^{\circ} 1' 30''$ East six hundred fifty-two and thirty-two one-hundredths (652.32) feet to a stone monument, thence South $57^{\circ} 25'$ East two hundred sixty-six and eighty-four one-hundredths (266.84) feet to a stone monument, thence same course seven feet (7.0') to the center of an oak tree at the end of a stone wall, thence South $86^{\circ} 52'$ East one hundred fifty-eight and seventy-one one-hundredths (158.71) feet to an oak tree in the division line between land of said Oliver A. Moore and land of C. A. Williams, thence south $38^{\circ} 55'$ West along said division line about seven and five tenths (7.5) feet to land of Town of Westfield, thence westerly and southerly along land of said Westfield to place of beginning. The fore-going taking includes all land included within the above described lines.

Said Town of Westfield, by its Board of Water Commissioners, Sumner W. Hildreth and Frank S. Dewey, Jr., for the purposes aforesaid has taken all the rights to the above described tract of land.

In witness whereof, we, the said Sumner W. Hildreth and Frank S. Dewey, Jr. have hereunto set our hands this twenty-first day of November in the year of our Lord, One Thousand Nine Hundred and Four.

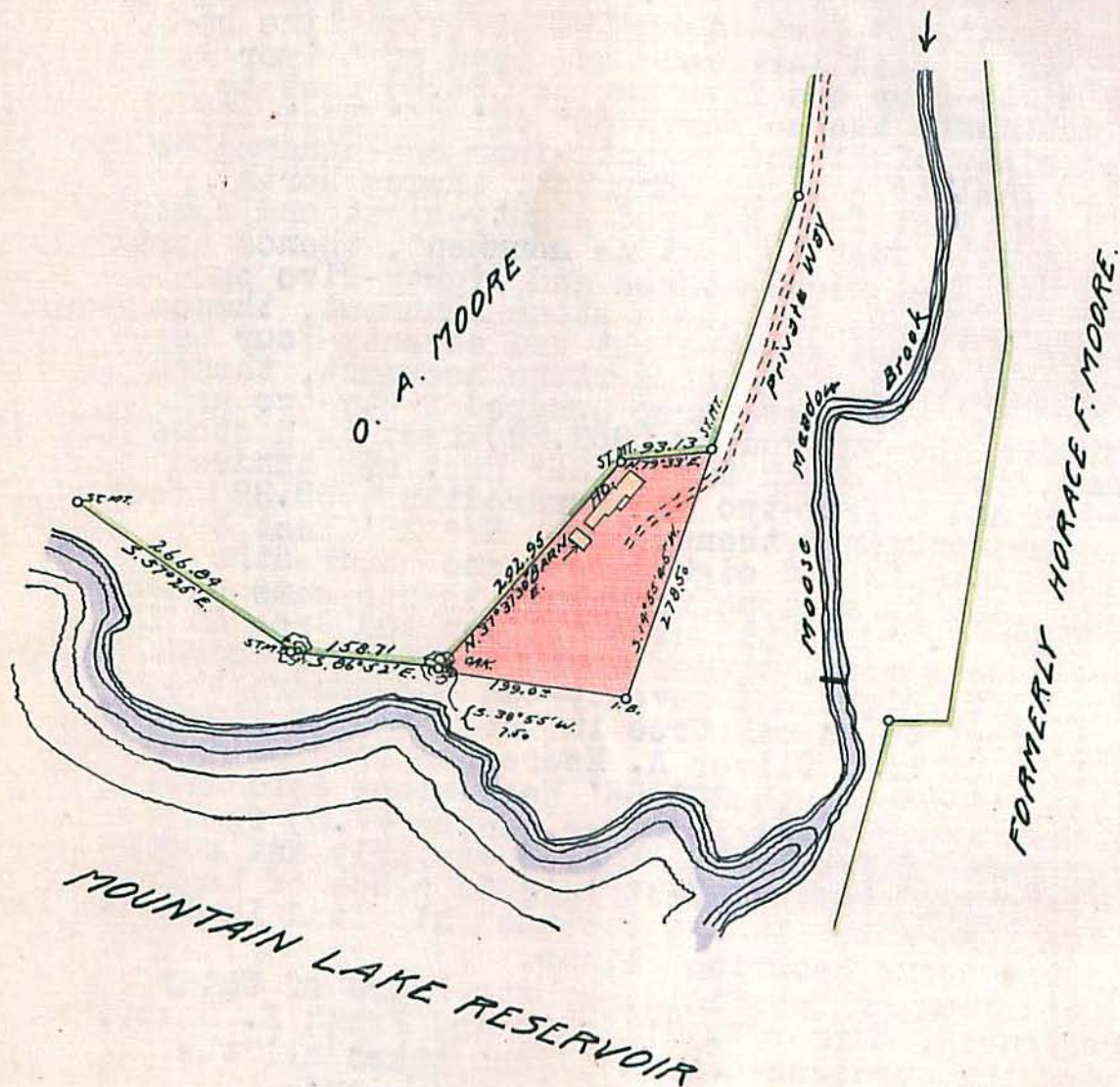
(Signed)

Frank S. Dewey Jr

S. W. Hildreth

In the presence of

Clifford T. Tucker



WESTFIELD-WATER-WORKS
 Montgomery Supply
 MAP OF LAND TAKEN
 - F. E. WILLIAMS -
 - SCALE 1200 FT. = 1 INCH. -
 - OREN E. PARKS - C.E. -
 - 1905 -

Land taken formerly of Frances E. Williams, July 1, 1905.

KNOW ALL MEN,

That the Town of Westfield, in accordance with the authority given by an Act of the Legislature of Massachusetts entitled "An Act to Supply the Town of Westfield with Pure Water," approved May 29th., 1873 and for the purposes named in the 1st. and 3rd. sections of said act, have taken and do hereby take the following described land situated in Montgomery, Hampden County, Massachusetts, and formerly belonging to Frances E. Williams:-

Commencing at an iron monument at the southeasterly corner of land formerly of Frances E. Williams and at the southwesterly corner of land of Town of Westfield taken of O. A. Moore Dec. 20, 1883, thence westerly along land of Town of Westfield about one hundred ninety-nine (199.0) feet, thence North $38^{\circ}55'$ East along land of Town of Westfield about seven and five tenths (7.5) feet to the centre of an oak tree, thence North $37^{\circ}37'30''$ East along land of O. A. Moore two hundred ninety-two and ninety-five one-hundredths (292.95) feet to a stone monument, thence North $79^{\circ}33'$ East along land of said Moore ninety-three and thirteen one-hundredths (93.13) feet to land of said Town, thence South $14^{\circ}55'45''$ West along land of said Town two hundred seventy-eight and five tenths (278.5) feet to the place of beginning.

Said Town of Westfield, by its Board of Water Commissioners, Sumner W. Hildreth, F. S. Dewey Jr. and J. Horton Packard, for the purposes aforesaid have taken all the rights to the above described tract of land.

In witness whereof, we, the said Sumner W. Hildreth, F. S. Dewey Jr. and J. Horton Packard have hereunto set our hands this first day of July in the year of our Lord, one thousand nine hundred and five.

(Signed) *S. W. Hildreth, Chairman*
F. S. Dewey Jr.
J. H. Packard, Treasurer.

In the presence of

Orin E. Parks

Wilbraham Dam Inspections - 1956 - 1967



1956 Reports

Inspections by Tighe & Bond.

Abutters	Wilbraham Industrial Park
City/Town	Wilbraham
Dam	Collins Manufacturing Company Dam
Dam	Gengreau Dam
Dam	Sullivan Dam
Dam	Riddle Dam
Dam	Green Dam
Dam	Y M H A Dam
Dam	Green Acres Fruit Farm Dam
Dam	Wilbraham Paper Company Dam
Dam	Bennett Dam
Dam	Rice Dam
Dam	Guidette Dam
Dam	Powers Dam
Dam	Green Dam
Railroads	Boston & Albany Railroad
Streets	Crane Hill Road
Streets	Burleigh Road

Streets	Soule Road
Water	Chicopee River
Water	Twelve Mile Brook
Water	Calkins Brook
Water	Mill River

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, INC.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

CD-Wilbraham

Dec. 14, 1956.

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts

Gentlemen:

Recent inspections of the dams in the Town of Wilbraham have now completed the inspection routine in this community and, all dams have been examined once or more times during 1956. The following is a report on the condition of the various dams situated in Wilbraham.

A. Collins Mfg Co. Dam(Wilbraham Paper Co.)

This dam is not the main power dam located on Chicopee River, but is the dam known as the Process Water Dam and is located on Twelve Mile Brook, upstream from the main line tracks of the Boston & Albany Railroad. The dam is located just south-westerly of Crane Hill Road. This has been used to provide a pond as a source of process water for the Wilbraham Paper Company, formerly the Collins Mfg Company. The dam was composed of masonry, driven steel sheet piling and earth embankments.

In the flood of August, 1955, the runoff on Twelve Mile Brook was extremely great and tremendous damage resulted along the brook. This dam was washed out with the major breach occurring at the right end for a length of about 60 ft., more or less, along the dam. At the time of the last inspection no work had been done in regard to the repair of this structure. During the past year certain stream clearance work had been accomplished and improvements were made along Twelve Mile Brook, in the general area of the dam. There is no indication as to whether or not this dam will be repaired. At the present time, a water-way exists for the unobstructed passage of the flow of the brook thru the dam.

B. Riddle Dam.

This was a stone masonry and earth dam located on Calkins Brook, just upstream from its mouth on Twelve Mile Brook and easterly of Crane Hill Road. Past inspections have shown that there has been very little pondage at the site of this dam. The pond area

has been silted up over the years and when inspected, prior to the flood of 1955, the volume behind the dam was taken up entirely with silt and sand and very little water was in storage. During the flood of August, 1955, the entire dam was washed away. Though no reconstruction of this dam has been started, the area will be checked in the future, to be certain that a dam is not built, at this location, without filling proper plans and specifications. The site is one that might be easily adapted to the formation of a small pond, for private recreational use. When last inspected there was no water in storage and a reasonably free waterway existed at the site.

C. Dr. Sullivan Dam.

This is an earth dam located on Twelve Mile Brook upstream from the mouth of Calkins Brook and easterly of Crane Hill Road. The dam consists of an earth embankment with an around-the-end channel spillway of considerable size. The spillway was constructed with a concrete cutoff wall and a riprap paving. The pond formed by the dam is used for private recreational purposes. During the flood of August, 1955, the flood water passing thru the spillway canal washed out a considerable quantity of the spillway channel and at the same time topped the dam and washed out the central section of the earth embankment. When last inspected, no repair work had been started nor was contemplated in regard to this dam. A free waterway sufficiently large to allow for the passage of Twelve Mile Brook exists at the site of this dam.

D. Green Dam.

This is a very small earth and cobblestone masonry dam, located on Spear Brook, just easterly of Ridge Road and downstream of the crossing of Spear Brook under Ridge Road. The pond formed by the dam is very small and has been used for private recreational purposes. The small pond has been reduced in size in recent years by the silting of the basin behind the dam. Though the dam has been somewhat dilapidated, its size is generous for its height. During the flood of August, 1955, no damage of consequence occurred at this dam. When last inspected this dam was still in a somewhat dilapidated state and the pond behind the dam was found to no longer exist. It has been completely filled with silt and sand deposits so that at the present time, the flow of the brook simply approaches the spillway of the dam in a small channel and then the water cascades over the spillway in the manner of a simple and low waterfall. This dam is satisfactory for the present time.

E. Gengreau Dam.

This is an earth and masonry structure located on a feeder brook

to Mill River, in the southwesterly portion of Wilbraham. It is located immediately upstream of Soule Road. The dam has been used for private recreational purposes and for the generation of power for use by the Owner. During the flood of August, 1955, the dam was topped by the flood water and the earth embankment to the right of the spillway was washed thru. The spillway structure itself was not damaged. When last inspected, no permanent work had been done at the site of this dam though the Owner had cleaned up the area and indicates that he intends to repair the structure. A free waterway exists in the location of the breach and no water is at present ponded behind this dam.

F. Y.M.H.A. Dam.

This is an earth dam with a masonry spillway located immediately downstream from the Gengreau Dam, just described and situated southerly of Soule Road. The dam is used to form a pond for recreational purposes in connection with the Y.M.H.A. day camp. During the flood of August, 1955, no damage of consequence occurred at this structure. A very small wash occurred on the embankment fill adjacent to the spillway. This wash has since been repaired and the dam is in excellent condition.

G. Powers (now Green) Dam.

This is a concrete masonry dam backed with an earth and boulder fill on the downstream side. It is located on a tributary to Mill River and is upstream of the two previous dams reported on. It is located to the south of Burleigh Road. This dam forms a pond that is used for private recreational purposes and also is used in connection with a fishing club. The dam has been somewhat dilapidated for a number of years but, the masonry itself is in generally good condition and the earth embankment downstream of the dam is fairly substantial. No damage of consequence occurred at this structure during the flood of August, 1955. The dam as a whole was not topped by the flood water, but the water passing over the spillway section, in the center of the dam, washed out some of the boulder fill. This fill should be replaced. The undersigned has met with the Owner of this dam and has discussed its condition. The Owner plans certain improvements to the dam and will make these improvements during the winter and spring months.

In summary, there are a total of seven dams, in the Town of Wilbraham. Four of these dams were washed thru and breached by the flood of August, 1955. There is no indication, at the present

CD-Wilbraham
Dec. 14, 1956

time, that three of them will be repaired in the near future. However, there is an indication that the Gengreau Dam may be repaired in the near future. The Owner is preparing plans and specifications to submit to your Board for review and approval or recommendations. The remaining three dams withstood the flood waters with little or no damage.

Respectfully submitted


George H. McDonnell
County Hydraulic Engineer

GHM/cmb

WATER SUPPLY
SEWER.
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, Inc.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991
GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

CD Wilbraham

Nov. 20, 1957

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Recent inspections of the dams in the Town of Wilbraham have now completed the inspection routine in that community and all dams have been examined at least once during the year 1957. The following is a report on the condition of the various dams situated in Wilbraham.

A. Collins Mfg. Co. Dam (Wilbraham Paper Co.)

This dam is the Process Water Dam located on Twelve Mile Brook upstream from the main line tracks of the Boston & Albany Railroad. The dam has not been repaired since the flood of August, 1955. The dam is still breached and no water can pond behind the structure. The free waterway is sufficiently wide and clear to pass flood flows. Thus, conditions are satisfactory at this dam.

B. Riddle Dam

This dam, located on Calkins Brook, a tributary of Twelve Mile Brook, was breached in the flood of August, 1955. The dam has never been repaired nor restored. The breach is sufficiently wide to allow for the passage of flood flows. A small swimming hole has been formed near the site of the old dam by placing rock and granular fill across the brook. This swimming hole is shallow and small and does not constitute a dam. Conditions at the site of the Riddle Dam are satisfactory.

C. Dr. Sullivan Dam

This dam, located on Twelve Mile Brook suffered damage in the flood of August, 1955. The earth embankment was partly washed thru. Large boulders and sand bag construction have blocked the breach to the height of the spillway channel. Water now flows thru the spillway channel as well as thru the stone blocked breach. Though conditions at this dam are not entirely satisfactory, they do not present any danger to persons and property

downstream. The owner apparently wishes to maintain the pond and the work done to date, though temporary in nature, is relatively safe and stable. Conditions at this structure will be examined from time to time to be certain that repairs of a permanent nature will be safe and meet the requirements of good workmanship. As existing at the present time, conditions are satisfactory.

D. Green Dam

Conditions at this dam are satisfactory

E. Gengreau Dam

This structure, located on a feeder brook to Mill River, is situated just upstream of Soule Road. The dam was breached around the right end through natural ground in the flood of August, 1955. The owner has submitted plans and specifications for the repair of this dam and for the construction of improved spillway facilities. Repairs to the dam have been started. The breach around the right end has been filled with an earth embankment section. This fill is relatively massive considering the small pond to be formed. When last inspected, the workmanship looked very good. The new spillway construction had been started and the owner expected to be doing some concrete work on this spillway in a very short while. Inspections will be made from time to time during the construction of this spillway. Conditions as existing when the dam was last inspected, were satisfactory.

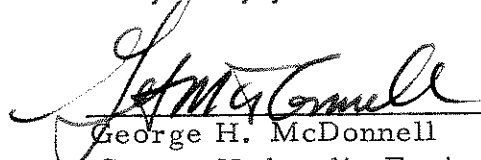
F. Y.M.H.A. Dam

This dam was found to be in very good condition.

G. Powers Dam (now Green)

This dam is located on a tributary to Mill River and is upstream of the Gengreau Dam. It is located to the south of Burleigh Road. When last inspected, the pond was found to be completely dry. Some improvements have been made at the dam by dumping very heavy rock in the spillway section. This is in accordance with recommendations made to the owner. This improvement to the spillway corrects to some degree the flood damage that occurred in 1955. The masonry wall forming the upstream portion of the dam is somewhat dilapidated but the structure is quite safe. Conditions at this dam are satisfactory.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GEORGE H. MC DONNELL

PHILIP W. SHERIDAN

EDWARD J. BAYDN

TEL. JEFFERSON 3-3991

TIGHE & BOND
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS

CIVIL, SANITARY AND
ELECTRICAL ENGINEERING
SUPERVISION OF CONSTRUCTION
AND OPERATION
INVESTIGATIONS, REPORTS,
PLANS AND SPECIFICATIONS

CD Wilbraham

Nov. 4, 1958

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Recent inspections of the dams situated in the Town of Wilbraham have now completed the inspection routine in that community and all dams have been examined at least once during the year 1958. The following is a report on the condition of the various dams in Wilbraham.

A. Collins Mfg. Co. Dam (Wilbraham Paper Co.)

This dam was destroyed in the flood of August, 1955, and no steps have been taken to repair or restore the structure. Ample space is provided for passage of brook flows thru the dam without ponding any water. As conditions now exist, the dam presents no danger to persons and property downstream.

B. Riddle Dam

This dam was breached in the flood of August, 1955. The breach is quite wide and free flow of the brook exists thru the site of the dam. A very small swimming hole has been formed by placing large rocks and boulders across the brook near the site of the dam. The small swimming hole formed contains very little water and the boulder barrier does not really constitute a dam.

C. Dr. Sullivan Dam

This dam suffered considerable damage in the flood of August, 1955. The earth embankment was partially washed thru and the downstream concrete masonry wall was breached and a section of the wall tipped.

Large boulders in the breach thru the earth embankment block the flow of the brook and has resulted in the pond being reformed. This does not constitute a dangerous condition. The breach is well lined with the heavy boulders and water of the brook not only flows thru the breach but also flows thru the large spillway channel. The rock and boulder section at the breach is quite wide and the slope relatively flat. Stored water would not be released downstream in a rush as a result of flood conditions. Any eating out of the rock and boulder filled breach would progress very slowly and only at the time of very heavy runoff.

D. Green Dam

The pond behind this dam is completely filled with sand and gravel and the area is overgrown with grass and weeds. The dam is now nothing more than a waterfall in the brook. The brook water cascades over the rocks that constitute the dam. For all practical purposes, no dam now exists at this site.

E. Rice Proposed Dam

No work has been started on this dam as of the time of the last inspection on October 30, 1958.

F. Gengreau Dam

The earth embankment of this dam is in good condition. Work has been started on the new spillway construction at the easterly end of the dam. Forms are being set for the concrete abutment wall. A small cofferdam is in place just upstream of the construction area. The pond is empty and the drain gate is open. The cofferdam is much too small in size to withstand a full pond should runoff exceed the gate and drawoff pipe capacity. The cofferdam should be widened and strengthened and the construction of the new spillway should be speeded up.

G. Y. M. H. A. Dam

Conditions at this dam were found to be satisfactory. The dam embankment should be cleared of all brush and vegetation except for the turf and grass.

H. Powers Dam (Now Green)

The drawoff pipe is open at this dam and the pond is empty. Work of improving the pond bottom apparently has been going on. Though the dam is dilapidated, it is safe and in satisfactory condition. Both the main spillway and the small around the end spillway at the right are in satisfactory condition.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wilbraham
Dec. 2, 1959

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections conducted recently within the Town of Wilbraham have now completed the inspection routine in that community and each and every dam within Wilbraham has been examined at least once during the year 1959. The following is a report on the condition of the various dams in Wilbraham.

A. Collins Mfg. Co. Dam (Wilbraham Paper Co.)

This dam is still breached as a result of the flood of August, 1955, and no pond is formed. The breach thru the dam is wide and allows for the passage of flood flows without ponding any water. As conditions now exist, the dam does not present any danger to persons and property downstream.

B. Riddle Dam

This dam has been breached and, as a result of the flood of August, 1955, little or no evidence of the old dam remains. At the site of the old dam a small boulder barrier has been placed in the brook. This is nothing more than a pile of boulders about 2 ft. in height and, upstream of the boulders, a small and shallow pool is formed. The pool appears to be used for wading purposes by children in the neighborhood. Hardly any water is stored and the pile of boulders does not constitute a dam.

C. Dr. Sullivan Dam

This dam is still breached as a result of the flood of August, 1955. The breach thru the earth embankment is lined with heavy boulders and the water of the brook flows thru the breach on the natural boulder paving.

One section of the masonry wall forming part of the dam is tipped over and thus results in a wide opening thru the dam embankment for the passage of brook flow. Though the water in the pond is stored to about normal elevation, there will be no sudden release of stored water downstream because of the large width of the earth embankment, the large and heavy boulders lining the breach and the low vertical height of the dam. Any loss of the dam will occur very slowly as the breach is eaten deeper and deeper. There will be no sudden release of water at this location. Consequently, it is not necessary to order any repairs to this dam.

D. Green Dam

There is absolutely no water ponded at this dam. The pond volume is 100% filled with sand and gravel. The dam and spillway now are nothing more than a waterfall in the brook. No damage could be done downstream as a result of failure of the dam since no water is stored. The dam consists of stone and boulders with earth fill and, at the spillway area, the stone is being eroded away slowly.

E. Rice Dam

No major work has been started at the site of this dam as of the most recent inspection. Some clearing in the pond area has been started.

F. Gengreau Dam

The left abutment masonry wall for the new spillway has been completed. The downstream spillway wall of cemented field stones has also been completed. It would seem advisable to increase the thickness of this stone masonry wall to prevent its failure should full hydrostatic head be applied against the upstream face. The wall could be enlarged in cross-section by adding more stone work behind the present wall and tied into the present wall, or the present wall could be backed up with poured-in-place concrete forming a second wall behind the stone masonry. Though this wall will be entirely backfilled with compacted earth and capped with a concrete slab, water in storage from the pond may seep into the compacted earth spillway and exert pressure against the upstream face of the wall tending to move it downstream and at the same time tending to rotate the wall about its base. A few weep holes in the wall to relieve hydrostatic pressure might be a desirable addition. The work on this new and additional spillway should be completed as soon as possible.


G. Y.M.H.A. Dam

The earth embankment at this dam should be cleared of tree growth and brush. Otherwise, conditions at the dam were found to be satisfactory.

H. Powers Dam (Now Green)

This dam is in the same general condition as reported in previous years. At the time of the last inspection, the pond was found to be empty and the drawdown conduit thru the dam was open. The dam itself, including the masonry wall, is somewhat dilapidated but the structure is safe. Both the main and the side spillway are in satisfactory condition. The general stone mass fill downstream of the masonry wall is in good condition.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wilbraham
Sept. 9, 1960

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections conducted recently throughout the Town of Wilbraham have now completed the inspection routine in that community and every dam situated within the Town of Wilbraham has been examined at least once during the year 1960. The following is a report on the condition of the various dams in Wilbraham.

A. Collins Manufacturing Co. Dam (Now Alchar-Wilbraham Corp.)

This dam is still in the same general condition as the result of the flood of August, 1955. No pond exists and the breach thru the dam is quite wide allowing for the passage of flood flows without the ponding of water.

B. Riddle Dam

This dam, breached in the flood of August, 1955, has never been repaired or replaced. Little evidence of the old structure now remains. It is doubtful if a dam will be constructed again at this location since the flood waters washed a wide opening thru the sandy valley. Future inspections of the site will be unnecessary.

C. Dr. Sullivan Dam

This structure was found to be in the same general condition as reported last year. The damage caused by the flood of August, 1955 has not been repaired. Water is ponded behind the dam but conditions as they exist do not endanger persons and property downstream. The flood-washed breach thru the earth embankment allows for the passage of overflow from the pond. This breach is lined with many heavy boulders and the

continuously running water causes no further erosion. The old spillway canal still functions and there is sufficient capacity to pass storm flows. Much of the dam area is now becoming overgrown with brush and vegetation. The pond shows signs of being filled in part with sand and silt deposits. Pond vegetation is beginning to grow. Conditions are satisfactory for the present.

D. Green Dam

No water is stored at this dam. The pond volume has been completely filled with deposits of sand and gravel. The spillway at the dam is now nothing more than a waterfall in the brook course.

E. Rice Dam

No further work has been done in connection with the construction of the proposed dam on Rice property located easterly of Main Street south of Wilbraham Center.

F. Gengreau Dam

Construction of the new spillway has been nearly completed. The masonry walls of the new spillway, both upstream and downstream are quite thin and it is doubtful if they will be stable under serious high water conditions. The unsupported height of the downstream wall is about 5 ft. while the thickness of this wall is probably no greater than 18 in. at the base. The hydraulic pressure that could be exerted against this wall will probably cause it to fail. The wall should be increased in cross-section by adding more stone work to this wall tied into the present construction. The same strengthening of the upstream wall should be done.

The stone apron downstream and at the toe of the spillway is composed of small light-weight stones. These will be displaced and washed away by overflowing flood waters. A heavy apron should be constructed or stone of proper weight placed at this toe area.

To the left of the new spillway an earth embankment should be constructed to prevent the flow of ponded water around the new spillway. Work recommended herein should be accomplished by the owner before the new spillway is activated.

G. Y.M.H.A. Dam

All brush and small tree growth on the earth embankment should be cut down. The worn section of the embankment at the abutment walls should be repaired.

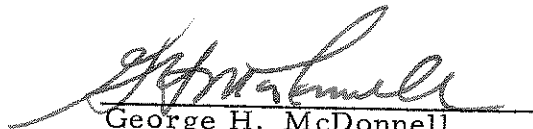
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-3-

H. Powers Dam (Now Green)

This dam was found to be in the same general condition as reported previously. The pond was found empty and there is evidence that no water was ponded during 1960. The bottom of the pond is becoming overgrown with vegetation. The drawoff gate is open to allow the passage of brook flow. Though the dam is quite dilapidated, it is fairly large in section and in the opinion of the undersigned, is not dangerous to persons and property downstream.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wilbraham
Oct. 31, 1961

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections recently conducted throughout the Town of Wilbraham have now resulted in the completion of the inspection routine in that community and every dam situated within the Town of Wilbraham has been examined at least once during the year 1961. The following is a report on the condition of the various dams in Wilbraham.

A. Collins Manufacturing Co. Dam (Now Alchar-Wilbraham Corp.)

This dam is still in the same general condition as existing since the flood of August, 1955. No pond is formed and the breach thru the dam, caused by the flood, is very wide and deep. It is capable of allowing the passage of flood flows without ponding any quantity of water.

B. Dr. Sullivan Dam

This dam was noted to be in the same general condition as reported in 1960. The breach in the dam embankment is becoming wider and deeper. The breach can safely pass flood flows. It is lined with heavy boulders washed into their present locations and the boulders are stable enough to prevent any rapid erosion of the breach itself. It will take many Spring and Fall flood runoffs to eat away the breach to a point where no water will be ponded. The old spillway canal is becoming overgrown with brush and trees. The breach in the embankment is now low enough whereby normal stream flow does not pass thru the old spillway canal. At the time of the last inspection the pond was considerably lower than noted in previous years. This

is because of the deepening of the breach. The embankment area is becoming overgrown with trees and brush and a portion of the old concrete wall still stands.

C. Green Dam

This dam stored no water since the volume of the pond has been completely filled with sand and gravel washed in over the years from the valley above. The spillway of the old dam is now nothing more than a waterfall in the course of the brook and it apparently will not be necessary to make many more inspections at the site of this dam.

D. Rice Dam

No further work has been done in connection with the construction of this proposed dam on the Rice property. The site of the dam is located easterly of Main Street and south of Wilbraham Center. The site was last inspected on October 13, 1961.

E. Gengreau Dam

The new spillway under construction at this dam has apparently been plastered with a thin cement cover that, from all outward appearances, adds little, if any, strength to the structure. In fact, it is possible that the downstream face of the spillway, as now existing with the cement plaster, will cause more trouble than doing good for the dam. By cement plastering the downstream face of the stone wall, said wall having been reported as too thin in the inspection of last year, water pressure will now build up behind the wall and could be released suddenly by failure of the cement plaster.

It was also noted that brick piers have been built on the spillway floor and these piers are apparently for the purpose of holding stoplogs. The copy of the plan in my file showing the approved construction, does not allow for any such construction nor for the installation of stoplogs. The Owner should be directed to follow the approved plan in detail and to only make any deviation from the plan after first obtaining approval of the change from your Board.

The necessary earth embankment has not been built to the left of the new abutment wall. This embankment should be built and all

noted deficiencies corrected before the Owner is allowed to pond any water.


F. Y. M. H. A. Dam

The brush growth on the embankment portion of this dam should be kept cut down. This applies to both sides of the masonry spillway. Worn and eroded areas of the embankment, particularly adjacent to the spillway, should be brought to proper grade and repaired.

G. Powers Dam (Now Green)

This dam was found to be in the same general condition as noted a year ago. Apparently no water has been ponded at the site of this dam all year. The dam masonry and the embankment are still in the same general dilapidated condition, but they are not dangerous. If the Owner does not plan to do any repair or construction at the dam in the near future, he should be advised next year, or the year following, to provide a reasonably good free waterway thru or around the dam.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/cmb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wilbraham
June 27, 1962

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections recently conducted throughout the Town of Wilbraham have now resulted in the completion of the inspection routine at every dam situated within the Town. Each dam has now been examined at least once so far in 1962. The following is a report on the condition of the various dams in Wilbraham.

A. Collins Manufacturing Co. Dam (Now Alchar-Wilbraham Corp.)

No changes have been made at this dam since the time of the last report. The dam is in the same general condition as existing since the flood of August, 1955. No pond is formed and the breach thru the dam, caused by the flood of 1955, is very wide and deep. The breach is capable of allowing the passage of flood flows without ponding any quantity of water.

B. Dr. Sullivan Dam

This dam was found to be in the same general condition as reported in previous years. The breach thru the dam embankment is about the same however, it may be slightly wider and a bit deeper. The breach has sufficient capacity to safely pass flood flows. The heavy boulders lining the breach are interlocked in such a way that they are quite stable and it is doubtful if any rapid erosion will ever occur in the breach itself.

The general area of the old dam embankment and the old spillway canal is becoming heavily overgrown with brush and small trees. It is doubtful if this dam will be reactivated in the immediate future. The structure will be checked annually to be certain that the breach is not closed.

C. Green Dam

The pond in back of this dam has been completely silted in and no water whatsoever is now stored. The small brook flows across the filled-in basin and then cascades over the worn and dilapidated stone masonry dam. As now existing, the structure is nothing more than a waterfall in the course of the brook. It has been found in this same general condition for a number of years. Future inspections at the site of this dam are no longer necessary.

D. Rice Dam

No further work has been done in connection with the construction of this proposed dam on Rice property. The dam is located easterly of Main Street and south of Wilbraham Center. Though the owner does plan the construction of a dam to form a pond for irrigation purposes, no active work has been done at the site for some time and no water whatsoever is ponded.

E. Gengreau Dam

This dam was found to be in the same general condition as noted during the annual inspection of 1961. The new spillway construction has been covered over with a thin coat of cement plaster and, from all outward appearances, little if any strength has been added to the structure by this plaster coating. In fact, it is possible that the downstream face of the spillway, as now existing and as covered with the cement plaster, will move or fail when a hydraulic head results. When inspected prior to the placing of the plaster covering, the downstream stone wall at the spillway was reported as too thin for its height and the load it will be carrying.

The brick piers built in the spillway and noted last year still exist. The approved plan does not provide for any such construction and the piers should be removed from the spillway before any water is allowed to be ponded.

The necessary earth embankment has not been built to the left of the new abutment wall. This embankment should be built and all noted deficiencies reported herein and previously called to the attention of the owner should be corrected before storing water.


F. Y. M. H. A. Dam

The earth embankment areas reported a year ago as in need of maintenance and repair have been fixed and the embankment is in good condition. Wooden fence construction now prevents persons from walking up and down the embankment adjacent to the spillway and causing the gullying and the wearing of the earth surface. Most of the brush on the embankment has been cut as recommended. The dam in general, was found to be in very good condition. The spillway structure was found to be satisfactory. It was noted that three 2" boards are set across the spillway and at an elevation slightly above the normal water level in the pond. These boards act as a safety barrier for children boating on the pond. The boards have a long enough span whereby flood flows will cause them to fail and the capacity of the spillway will not be reduced due to their presence.

G. Powers Dam (Now Green)

This dam was found to be in the same general condition as noted in 1961. No water has been ponded at the site of this dam for some time. The masonry and the embankment are still in the same general dilapidated condition but they are not considered to be dangerous to persons and property downstream. As mentioned in our report of last year, the owner should be advised within a year or so to either repair the dam and make it completely safe, or cause a reasonably good free waterway to be formed thru the structure. It is recommended that such a letter be forwarded in 1963 if no change has been made to the dam by that time.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wilbraham
July 30, 1963

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Inspections conducted recently throughout the Town of Wilbraham have now resulted in the completion of the inspection routine at every dam situated within that Town. Each dam has now been examined at least once in 1963 and the following is a report on the condition of the various dams in Wilbraham.

A. Collins Manufacturing Co. Dam(Now Alchar-Wilbraham Corp.)

This dam is in the same general condition as reported previously. The dam was breached in the flood of August 1955 and no repairs have ever been made on the structure. No pond is formed and the breach thru the dam is wide and deep. The breach is capable of passing flood flows without ponding any quantity of water.

B. Dr. Sullivan Dam

This dam was found to be in the same general condition as reported in recent years. The breach thru the embankment is wide and fairly deep. It is lined with heavy boulders. The breach is capable of passing flood flows. The entire dam site is becoming heavily overgrown with brush. Though the dam is breached and quite dilapidated, it does not present a danger to persons and property downstream. It is doubtful if this dam will be reactivated in the near future. However, the structure is checked annually to be certain that the breach is not closed.

C. Rice Dam

No work has been done in connection with the construction of this dam

as of the date of inspection, Friday, July 19, 1963. The dam site is located easterly of Main Street and south of Wilbraham Center. At some date the Owner plans to construct the dam in accordance with Soil Conservation plans and specifications.

D. Gengreau Dam

This dam was found to be in the same condition as reported a year ago. No change has been made to the spillway construction and the embankment at the east abutment has not as yet been placed. No water is stored by the dam.

The Owner has been notified in writing by your Board of certain changes that must be made to the construction before water can be ponded. It does not seem necessary to notify him again, since conditions have not changed since the last inspection and your letter to Mr. Gengreau.


E. Y. M. H. A. Dam

The embankment of this dam was found to be in good condition. Brush growth will need cutting in 1964, if it is not cut by then. A recommendation in connection therewith will be submitted following the inspection next year, if the embankment has not been cut over. The masonry spillway was found to be in good condition. Two flashboards were in the spillway notch and these are of such a size and span that they will fail from bending at time of flood flow. The dam was considered safe when inspected.

F. Powers Dam (Now Green)

This dam was found to be in the same general condition as reported in 1962. No water has been ponded at the site of the dam. The masonry and the embankment are quite dilapidated but they appear to be structurally sound. The entire area of the dam is becoming heavily overgrown with brush and the Owner should be notified to cut this brush and to keep the dam and the embankment clear of this growth. It was not possible to make a good inspection of the structure because of the heavy brush growth. The Owner should maintain the dam in good condition or it should be breached and abandoned. It is recommended that your Board so notify the Owner.

Respectfully submitted


George H. McDonnell
County Hydraulic Engineer

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wilbraham
December 11, 1964

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Inspections conducted recently in the Town of Wilbraham have now resulted in the completion of the inspection routine throughout that community. Every dam in Wilbraham has now been examined at least once in 1964 and the following is a report on the condition of the various dams in Wilbraham.

A. Collins Manufacturing Co. Dam (Now Alchar-Wilbraham Corp.)

This dam, breached in the flood of August, 1955; is still breached and no repairs have ever been made on the structure. No pond is formed and the breach thru the dam is wide and deep.

B. Dr. Sullivan Dam

This dam is now owned by Donald V. Guidette of 14 Warrenton St., Springfield, Massachusetts. The dam is still breached as the result of the flood of August, 1955. The breach thru the embankment section of the dam is lined with heavy boulders. As the result of this boulder fill, water is ponded to a height of about 3 ft. above the elevation of the brook bed downstream of the dam. The concrete masonry portion of the structure was breached completely during the August, 1955, flood and consequently, the boulders in the breach are the only barrier that is forming the pond that now exists at this site. Over the past few years, these boulders have remained stable and there is no evidence of erosion or movement of the boulder fill in the breach.

In the opinion of the undersigned the structure, though breached and storing some water, does not endanger persons and property downstream.

No maintenance or work of any kind has been done in recent years in the vicinity of this structure. The lodge building that formerly was adjacent to the dam burned down a few years ago and no further development has taken place in the area.

While at the site of the dam on December 3, the undersigned noted that the old farmhouse on the property had been torn down and a new modern house was under construction. Also, it was noted that a road had been rough graded thru the pasture land and thru the woods in the vicinity and direction of the dam. On discussing this with a representative of the owner, the undersigned was informed that the road is for private use and for exercising horses. No development is planned in the area adjacent to the dam.

C. Rice Dam

This proposed dam is apparently under construction as of the Fall of this year. An inspection of the site of the proposed dam on December 3 showed that the pond area has been bulldozed and material excavated has been pushed up on the right bank as well as in the general vicinity of the brook valley as well as to the left of the brook and adjacent to the access roadway. Very little water is stored in the basin and what water that is stored is held back by a small ridge of excavated material pushed into the bottom of the narrow small brook valley.

In the general location of the brook valley the material that has been bulldozed onto the natural ground contains many boulders, miscellaneous brush, organic material and some muck. This material as existing should not be incorporated into the embankment of the dam. In order to get a good watertight embankment, selected soil should be placed on stripped ground in layers about 8" in thickness and each layer should be properly and thoroughly compacted.

D. Gengreau Dam

Reconstruction and enlargement of this dam began several years ago based upon filed plans and specifications. The owner stopped work on the dam and recommendations were made previously regarding poor workmanship and corrective measures that should have been taken, if the dam was to be completed and activated. However, the owner never did complete the structure and for the past two years or so it has remained inactive and the work has not been completed.

When last inspected, the partially completed structure was found to be seriously deteriorating and no water was stored. The new spillway section at the left part of the dam that was being constructed in an unsatisfactory manner and so reported, has failed in that the brook now passes under this gravel filled stone and concrete masonry section. Much of the earth fill under the masonry has been washed away and the masonry walls span the depression made by the stream as it flows under the structure. Eventually this masonry construction will crack and settle.

There is a large void under this incompleted spillway section and with the passing of time, the void will get larger. Should the structure fail at a time when stream flow is high, the settled spillway section could plug the free-flow area under the spillway and cause ponding of water. Also, the structure might be considered an attractive nuisance in that as the void gets larger, the opening under the spillway section could become large enough for a child to crawl under one of the walls of the structure and into the large void under the spillway floor. Failure of the spillway at that time could cause serious injury or death to an inquisitive child.

It is recommended that the owner of the dam be advised that since work has not progressed on this dam for a number of years and since the structure as now existing is in a dangerous condition, the Decree approving the additions and alterations to the dam be withdrawn and the owner ordered to breach the section of the new spillway construction.

If the Owner should decide at some later date to reconstruct the dam, then it would be necessary to again file new plans and specifications for consideration and approval.

E. Y. M. H. A. Dam

The embankment at this dam was found to be in fair condition. The spillway was satisfactory. Only a single low flashboard was on the crest and water level in storage was at the elevation of the top of the spillway board. The toe area of the dam embankment was in good condition as was the toe area of the masonry spillway.

Concrete walls of both abutments were satisfactory.

The Owner of the dam should cut down all brush growing from the earth embankment and in particular, the trees growing from the downstream

face of the embankment just to the right of the spillway as well as the single tree and vine growth on the downstream face of the embankment to the left of the spillway. Eroded sections of the earth embankment adjacent to the right spillway masonry wall should be repaired. Both the upstream and downstream surface of the embankment have been eroded and a sizeable depression exists. After the depression is filled with compacted earth, the surface should be loamed and seeded.

F. Green Acres Fruit Farm Dam

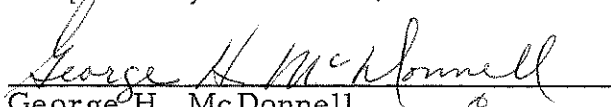
The Owner has cut brush from the area of the dam and as a result, a thorough inspection of the structure could be made. On the day of inspection, the pond was found to be empty and there was no flow in the brook valley. The dam is in fair condition but it does need attention. If the Owner intends to maintain this dam then to protect his investment and to protect persons and property downstream, certain maintenance and repair work should be done.

The upstream face of the concrete masonry is eroded and all voids should be filled with concrete grout. The top of the masonry wall should be repaired as necessary. The main spillway at the center of the dam embankment should be properly shaped and paved. The huge boulder now in the spillway opening should be moved in order that a proper masonry spillway channel could be poured and shaped.

The downstream stone masonry wall at the embankment section was in fair condition.

In doing repair work at the dam, the spillway capacity could be increased by constructing an around-the-end swale spillway on natural ground to the right of the dam. This would simply require the excavation of a fairly wide channel in natural ground to the right of the dam, at an elevation of about 6" above the crest elevation of the central spillway channel. The surface of this excavated swale spillway should be loamed and seeded so as to result in a good turf cover to prevent erosion in time of storm flow conditions.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mg

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wilbraham
November 23, 1965

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Inspections conducted recently within the Town of Wilbraham have now resulted in the completion of the inspection routine throughout the community. Every dam situated in Wilbraham has now been examined at least once in 1965 and the following is a report on the condition of the various dams in that community.

A. Collins Manufacturing Co. Dam (Now Alchar-Wilbraham Corp.)

This dam, breached in the flood of August, 1955, is still breached and no repairs have ever been made on the structure. No pond is formed and the breach thru the dam is wide and deep.

B. Dr. Sullivan Dam (Now Owned by Donald V. Guidette)

This dam is in the same general condition as reported since the flood of 1955 when the structure was breached. The dam now consists of a mass of large boulders, a failed concrete wall and miscellaneous debris. The area of the dam has become overgrown with brush and small trees. The spillway channel situated to the right of the dam proper has not functioned for many years since water has passed over and thru the rubble that once formed the dam embankment. The elevation of the existing mass of rubble is lower than the elevation of the spillway channel crest.

In past years, a small pond has been formed by the remains of the dam embankment. When inspected this year, it was noted that the drain pipe thru the old embankment has been opened and no pond whatsoever is now formed.

At the upper end of the old pond bottom, muck and mud is being cleared and stockpiled. It is possible that the owner is simply using the pond bottom for a soil borrow area. It is also possible that he may be cleaning the pond bottom in preparation for reactivating the dam. It is recommended that the owner be notified that no work be done to rebuild the dam without first filing plans and specifications for review and approval.

Conditions as noted at the time of the last inspection on November 19, 1965, were such that the remains of the dam do not endanger persons and property downstream.

C. Rice Dam

This dam has been built during the past year. The embankment is fairly wide in comparison to its low height. In fact, the width of the embankment is such that the downstream slope extends for 50 ft. or more to blend with the existing ground in such a way that the structure appears to be a part of the original ground. No loam or seed has been placed on the embankment construction and what little grass was noted is a wild growth developing in a spotty manner. The surface of the embankment is somewhat rough but the material is dense and will resist erosion.

A corrugated iron tube has been laid thru the embankment near the right end. The tube is 12" in diameter and will carry the normal flow of the small stream thru the embankment. Freeboard at this small dam is about 2 feet. On the day of inspection, water level in storage was at the invert of the spillway tube.

A swale spillway to handle flood flows has been constructed at the right end of the dam embankment. This spillway has been shaped in natural ground. It is at an elevation slightly higher than the tube spillway and consequently, will not operate until the capacity of the tube spillway is exceeded.

In the opinion of the undersigned, this dam is safe.

D. Gengreau Dam

This dam has been purposely breached by the owner, as directed by your Board, and the dam no longer stores water. The breach is wide enough and deep enough to safely pass flood flows. There is a pond formed

behind the dam but this pond has resulted from the operation of a gravel borrow pit and all water stored is below the elevation of the bed of the brook at the site of the dam.

E. Y. M. H. A. Dam

This dam is in the same general condition as noted a year ago and the recommended maintenance has not been accomplished. Flashboards have been removed from the spillway and water level in storage was at the masonry crest of the spillway. The concrete forming the spillway was found to be in good condition.

Portions of the dam embankment on both sides of the spillway are overgrown with brush. This brush should be cut down. Trees growing from the downstream face of the embankment just to the right of the spillway as well as the single tree and vine growth on the downstream face of the embankment to the left of the spillway should be cut down. Eroded sections of the earth embankment adjacent to the spillway should be repaired.

It is recommended that the owner again be notified to maintain the dam in a proper condition.

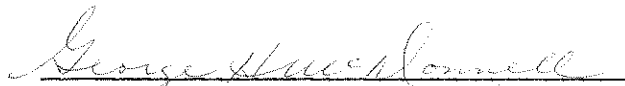
F. Green Acres Fruit Farm Dam

Brush has been cut from the embankment of this dam. Gravel fill has been placed on the embankment just to the left of the spillway. Also gravel has been placed in the spillway and it would appear that the owner is planning to pour concrete in the discharge channel just downstream of the spillway notch in the old concrete upstream wall. The upstream face of the concrete masonry is eroded and voids should be filled with concrete grout. Also, the top of the upstream masonry wall should be repaired as necessary.

At the request of the owner, the undersigned reviewed the work to be done at the dam. This conference in the field was held in the latter part of this Summer. The owner plans to make repairs to the dam and each year a portion of the recommended work will be done.

In the opinion of the undersigned, the dam was safe when inspected and in view of my conference with the owner, there is no need to send a letter of recommendation relative to the suggested repairs.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

C O N S U L T I N G E N G I N E E R S

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wilbraham
June 15, 1967

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Inspections conducted within the Town of Wilbraham have now resulted in the completion of the inspection of all dams located within that community. Each dam has been examined at least once during the year 1967 and the following is a report on the condition of these dams.

A. Collins Manufacturing Co. Dam (Now Alchar-Wilbraham Corp.)

This dam is still breached as a result of the flood of August, 1955. No repairs have ever been made on the structure. The breach formed by the flood is wide and deep and no water is ponded at this site.

B. Dr. Sullivan Dam (Now Owned by Donald V. Guidette)

No changes were noted at this dam since the time of the last inspection. The dam is still breached and the area at the dam is becoming overgrown with brush and small trees. A small shallow pond is formed by the heavy rock fill remaining in the breach through the dam. This rock fill was part of the original dam construction. The concrete core wall at the breach of the dam is broken open and a large section still remains but leans downstream. One section of the concrete wall was completely displaced by the flood flow waters and provides a wide space for the passage of stream flow. Though the dam does store a small and shallow pond, the existence of this pond caused by the heavy stone fill still remaining in the breach does not endanger persons and property downstream.

C. Rice Dam

The embankment forming this dam is quite rough on the surface but it is very wide for its shallow height. Turf cover is poor and spotty. Much of the surface of the dam embankment is hardpan and gravel.

The tube spillway was found to be satisfactory and operating. No toe seepage was noted along the bottom of the dam embankment. Water level in storage on the day of inspection was about 3" above the invert of the tube spillway.

The emergency flood flow swale spillway to the right of the tube spillway and at the right end of the small dam embankment was okay. There was some evidence that this spillway has operated during the heavy Spring rainstorms. Some erosion of the soil was noted in the emergency spillway but the material forming this spillway is quite stony and the erosion has simply caused the removal of the fine grained material. There is no turf growth on the swale spillway.

In the opinion of the undersigned, this dam was safe when inspected.

D. Gengreau Dam

This dam was purposely breached a few years ago. The breach is at the site of the spillway which was declared improperly built and was torn down. Water passing through the breach made at the spillway location has washed away material down to the natural brook grade. There is a pond formed at this site but this is the result of excavation rather than impounding of water by a dam.

In the opinion of the undersigned, conditions at this dam are satisfactory and the existing breach is wide and deep enough to safely pass flood flows.

E. Y. M. H. A. Dam

The earth embankment at this dam is rough in shape but the structure is in fair condition. Some improvement work has been done and soil erosion previously reported adjacent to the spillway has been corrected. Some of the tree and brush growth noted at the time of the last inspection has been cut down but all of this growth occurring on the sloping faces of the earth embankment should be removed and future growth should be discouraged. The earth embankment should be well maintained and

a good growth of turf should be developed. No toe seepage of any consequence was noted.

One flashboard was on the crest of the masonry spillway and water level was passing over the top of this board at a depth of about 1". The spillway structure was satisfactory.

It is recommended that the owner of the dam be advised to remove all brush growth from the earth embankment portion of the structure and take the steps necessary to form a good heavy turf cover.

F. Green Acres Fruit Farm Dam

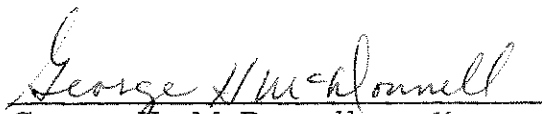
This dam has been greatly improved as promised by the owner since the time of the last inspection. The embankment portion has been cleared of all brush and small tree growth. The top and sloping downstream surfaces of the earth embankment portion of the dam are rough but satisfactory. There is minor toe seepage through the embankment at the right end of the dam. This is not an unusual occurrence.

The spillway chute has been improved with concrete. A concrete chute now extends from the notch in the masonry wall on the upstream face of the dam across the earth embankment portion of the dam and out beyond the downstream fieldstone wall.

The upstream masonry wall of the dam is still in need of repair. This is one of the items of work previously discussed with the owner. No doubt this maintenance and repair work will be the next job to be done. On the day of inspection, water level in the pond was at the elevation of the right small, around-the-end spillway notch. A trickle of water was flowing through this outlet around the dam.

This dam is in the best shape noted in a number of years and, in the opinion of the undersigned, was safe when inspected.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/mbf

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Wilbraham
December 2, 1969

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Inspections have been made of all dams in the Town of Wilbraham. Each of these dams coming under the jurisdiction of your Board has been examined at least once during the year 1969. The following is a report on the condition of each dam.

A. Collins Manufacturing Co. Dam (Wilbraham Industrial Park)

This dam is still breached as a result of the hurricane flood of August, 1955. No repairs have ever been made at the dam. The breach formed is very wide and deep. The only portion of the old dam remaining is the concrete gate shaft, the central section of steel sheet piling and some boulder fill on the downstream side of the piling. The remains of this dam cannot pond water.

B. Donald V. Guidette Dam (formerly Dr. Sullivan Dam)

This dam is in the same general condition as reported in recent years. The dam is still breached as a result of the flood of August, 1955 and the entire area at and around the dam is becoming overgrown with brush and trees.

The breach is wide and deep. It can safely pass flood flows without storing any large quantity of water. The small pond now formed is o. k. in that most of the pond volume is in excavation or is the result of heavy boulder fill in the bed of the stream at the site of the old dam. The boulder fill forms a rapids and shallow waterfall at the dam site.

The concrete wall, formerly a part of the destroyed dam, is broken open and a large section still remains but leans downstream. One section of the wall has been completely displaced by flood flow waters and provides a wide passage for stream flow.

In the opinion of the undersigned, this old dam as existing is satisfactory and it does not endanger persons and property downstream.

C. Rice Dam

The embankment of this small dam is in satisfactory condition. The grass cover is improving. The toe area of the wide embankment is dry.

The spillway tube is o.k., it was free of debris and was operating. Water level in storage was about 4" above the invert elevation of the tube inlet.

The swale at the right end of the embankment and to the right of the spillway tube was in good condition and free of any brush growth. There is very little erosion in this small swale.

There is no brush or tree growth occurring on any portion of the embankment except one large tree in the vicinity of the spillway tube. This tree does not endanger the dam.

In the opinion of the undersigned, the dam was safe when inspected.

D. Gengreau Dam

This dam remains breached. The opening is wide and deep. It can safely pass flood flows. The pond formed above the old dam is in excavation and is below the original elevation of the stream valley.

In the opinion of the undersigned, conditions at this dam are satisfactory. The breach is wide and deep enough to safely pass flood flows and the water ponded does not endanger persons and property downstream.

E. Y.M.H.A. Dam

The embankment forming this dam is satisfactory as to shape. Some surface erosion was observed on the slopes at the spillway sidewalls.

All tree and brush growth occurring on the sloping sides and on the top of the earth embankment should be cut down and any re-growth discouraged. Growth should be cleared from the embankment for a distance of 50 feet more or less on each side of the spillway structure.

The toe of the embankment is reasonably dry.

The concrete masonry of the spillway was noted to be satisfactory. Flashboards were still on the spillway crest on the day of inspection. They are bending downstream and will probably fail in the near future.

The flashboards should be removed from the crest of the spillway until after the spring runoff. Flashboards could then be replaced to raise the pond to normal elevation for summer use.

On the day of inspection, November 24, 1969, the pond was full and water was overflowing the flashboards.

In the opinion of the undersigned, the dam is safe. However, the tree and brush growth should be removed as recommended. Also, the flashboards should be taken off every fall and kept off of the spillway crest until after each spring snow melt and rainy season.

F. Green Acres Fruit Farm Dam

The pond was full on the day of inspection and water was flowing out of the pond around the right end of the masonry wall of the dam. This overflow takes place on solid natural ground and the condition is satisfactory.

The embankment is rough as to shape and surface area but it is satisfactory. Grass and turf cover are o.k. All tree and brush growth has been cleared from the embankment. The toe area was satisfactory. The toe was wet in the bed of the stream just below the main spillway section of the dam but this is a natural occurrence and conditions were noted to be o.k.

The cemented central spillway remains satisfactory and there is little or no sign of erosion, wear or boulder movement.

The dam could be further improved if the owner would make masonry repairs on the pond side face and the top of the concrete and stone masonry wall. When the pond is drawn down again, it would be

advisable to have all exposed masonry voids cleaned of loose material, dirt, vegetation and debris. After cleaning the voids, a good rich cement grout should be packed into each void. Broken areas of the wall on the surface could be replaced with a poured concrete mix containing moderately sized broken or washed stone.

The recommended repair work to the wall will protect the investment of the owner in this dam and should extend its useful life.

In the opinion of the undersigned, the dam is safe. The owner has made improvements to the dam in recent years.

G. Bennett Dam


The site of this dam was inspected on November 24, 1969. As mentioned in my communication of June 5, 1968, to your Honorable Board, the owner gave up the idea of building the dam and forming a pond by damming water. The pond now formed is entirely in excavation. The surface of the pond is at the elevation of the natural brook bed immediately downstream of the pond.

At the site of where the dam was to have been constructed, the owner has installed a fairly large fill on which he has constructed a roadway connecting a housing development on the south side of the stream with a proposed housing development on the north side of the stream.

The flow of the stream passes thru the roadway fill via three 4 ft. diameter culverts with head and end walls. The inverts of the culverts have been installed at about normal brook bed elevation. The level of the pond will be raised in time of extreme storm runoff when the tubes flow partially full or full. The rise in pond elevation will be in relation to the depth of flow thru the culvert tubes.

In the opinion of the undersigned, the pond as existing and the earth fill do not come under County jurisdiction since the pond is a dug pond and the earth fill is a roadway embankment thru which culverts have been placed.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer



End of Book D25-4 ~ Dams ~ Hampden County